

March 8-9, 2019

The Western Division of the
Canadian Association of Geographers

University of Victoria, Department of Geography,
Victoria, British Columbia, Coast Salish Territories



WDCAG 2019 Conference Program (with Abstracts)

61st Annual Meeting of the Western Division of the Canadian Association of Geographers
Hosted by: The University of Victoria on Coast & Straits Salish Territory

We acknowledge with respect the Lekwungen-speaking peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day. UVic recognizes that colonization and associated attitudes, policies and institutions have significantly changed Indigenous peoples' relationship with this land.

WDCAG 2019 Conference Program

Paper, Workshop, Panel, & Poster Sessions (March 9, 2019)



University of Victoria

All sessions are hosted in the Engineering / Computer Science Building, UVic campus

Room	8:30 or 8:50-10:00	10:30-12:00	12:00-13:00	13:00-14:30	15:00-16:30
A #116	First Year Human Geography Textbooks (Round table)	Out There Learning (Panel)	Jobs for Geographers (Panel)	"Who Transforms Whom" (Panel)	Geographic Education: The Student Experience
B #104	Geo-morphology, Geology & Minerology	Climate & Landscape Dynamics I		Climate & Landscape Dynamics II	Climate change impacts and resilience planning
C #108	Urban Inequalities	Urban Enviro Management		Urban Sustainability , Livability & Sense of Place	Towards Placemaking Matrix for Urban Development (Workshop)
D #124	Parks	Geographies of Health & the Body		Hazards & Responses	Islands
E #125	Food & Wine	Humanitarian Mapping (Workshop)		GIS & Remote Sensing I	GIS & Remote Sensing II
F #123	Colonialism, Imperialism, & Indigenous Geographies	Reconciliation is a verb (Workshop)		Storied Maps, UNSDGs and LGBTQ2+ (Workshop)	Toxic Masculinity (Workshop)
G #130	Resource Management in Asia	Geographies of Economic & Social Capital		Communicating for Change	The subjects of environmental governance
H #128			WDCAG Executive Meeting	Collective Biography (Workshop)	Field Journaling (Workshop)
Lobby		Poster Session* (10:00-10:30)	Poster Session (12:30-13:00)	Poster Session (14:30-15:00)	

*Posters will be available throughout the day in the main lobby. Poster authors will be available to showcase their work and answer questions at the noted times.

WDCAG Annual General Meeting will be held in Room 108 (16:30-17:30)

WDCAG 2019 Paper, Workshop & Panel Presentation Abstracts

Morning Sessions (8:30 or 8:50-10:00am)

A: Round Table Discussion (Room 116)

[8:30-9:50am] First Year Human Geography Textbooks (Round Table Discussion)

Facilitated by Kim Naqvi (Thompson Rivers University) - knaqvi@tru.ca

This discussion is intended to be a working session with the goal of generating alternative directions and possibly resources for teaching introductory Human Geography. It is primarily directed at faculty teaching human geography, but may also be of interest to students, and those introductory teaching introductory physical geography and environmental studies. The session will begin with a brief overview of available texts, their content and approaches, and some patterns of adoption and use. Participants will then discuss the benefits and limitations of the existing texts in the context of 1) their continuity with traditional content in contrast to current concerns, 2) their ability to address diverse and local Canadian geographies, in contrast to dominant urban geographies, and 3) their ability to connect to advanced human geography and to physical geography and environmental studies. The possibility of alternative topical chapters, the value of case study approaches, and possibility of field study approaches are options which can be explored.

B: Geomorphology, Geology & Minerology (Room 104)

[8:50-9:10am] A Volumetric Analysis of Tsunamigenic Landslides at Harrison Lake

Katie Hughes (University of Victoria) – k.hughes678@gmail.com

This research examines the risk of landslide-triggered tsunamis at Harrison Lake via investigating the morphodynamic context of these events in the past. The volumetric analysis of three large sub-aerial landslide deposits at Harrison Lake via multi-beam sonar survey is used to understand the impact wave generated from these events. The research attempts provide the input data needed for the reconstruction of previous landslide-triggered tsunamis at Harrison Lake via numerical propagation models, including: landslide volume, failure mechanisms, deposited material density and structure, and high-resolution lake bathymetry. Preliminary findings suggest Broken Ridge and Mt. Douglas landslides were tsunamigenic in nature and the resultant landslide-generated wave to be significant, in terms of the extent of damage a similar size event would produce.

[9:10-9:30am] Stratigraphy of the Thompson River Valley, Peterson Creek, Kamloops BC

Kaitlin Jaap (Thompson Rivers University) – kaitlin9jaap@gmail.com

Peterson Creek is a tributary to the South Thompson River, the lower part of its water shed falls within the Kamloops city limits and is protected in a nature park located in downtown Kamloops and reaches south into a Kamloops' subdivision of Sahali. Within the park there are many outcrops exposing not only modern-day deposition but also pre- and post- Late Wisconsinan

Fraser Glaciation deposition, most of which are along North facing slopes. There is little known regarding the geomorphic history of Peterson Creek before and after the Late Wisconsinan Fraser Glaciation; however, these outcrops may provide insight into the history of the park and downtown Kamloops and the geomorphic processes that have occurred within this area. The objectives of this research are: (i) to give a detailed sedimentological description of various lithostratigraphic units throughout the lower part of Peterson Creek and to develop a better understanding what types of environments would have occurred at the time of deposition of these lithostratigraphic units; and (ii) to develop a better understanding of what the geomorphic and depositional processes that occurred in Peterson Creek during the Late Wisconsinan Fraser Glaciation.

[9:30-9:50am] How Human-Induced Soil Degradation Affects Global Water Balance

Pei-Ling Wang & Johannes Feddema (University of Victoria)

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Despite of the rapid development of global models that include dynamic changes in land use and land cover (LULC), soil hydraulic properties are often assumed to be spatially or temporally constant. These assumptions can affect the results of model projections and impact assessments. This study focuses on revealing the physical impacts of human-altered soil conditions on the global water balance through a process-based soil degradation. We use a modified Thornthwaite water balance model combined with newly developed soil property and soil thickness datasets, and land-use impacts are assigned based on a LULC dataset. The soil water-holding capacity (WHC) data was obtained by running pedotransfer functions and integrating WHCs to the depth of bedrock and up to 2 m on a grid-by-grid basis. Two experiments are conducted to explore the impacts of simulated soil conditions on the global water balance: (1) Using soil WHC derived from the average soil properties of sub-grid soil, and the results are weighted by the grid fraction of each soil group; (2) allocating LULC on sub-grid soil groups and assigning various impacts on soil properties based on land-use types. The results demonstrate that how soils are represented in models can cause different impacts on estimates of global evapotranspiration, water deficit and surplus. This study will contribute to global studies of human-induced soil degradation and climate/hydrological models to assess the potential impacts of humans on the Earth system.

C: Urban Inequalities (Room 108)

[8:50-9:10am] Belonging: A Conceptual Lens for Exploring Socio-Spatial Inequalities in Neighbourhoods

Aimee Benoit (University of Lethbridge) – aimee.benoit@uleth.ca

In recent decades, globalisation, increasing mobility, and neoliberal forms of governance have all contributed to new forms of socio-spatial inequality in cities (Marcuse, 1997; van Kempen, 2007; Cassiers and Kesteloot, 2012). According to Wood and Waite (2011, p.201), these processes have both disrupted and increased individuals' desire for "locally-based' belonging." Yet, for the most part, belonging has not been explored in research on socio-spatial inequalities despite its importance as both a resource for cohesion and wellbeing, and as a basis for exclusionary behaviour. Reflecting on qualitative case studies of communities in Calgary, Alberta, this paper examines the concept of belonging as a lens for understanding how socio-spatial inequalities are produced, reproduced, and challenged within neighbourhood settings. Following theorists from human geography and related disciplines (e.g. Mee, 2009; Antonsich, 2010; Wright, 2015; Askins, 2016), I approach belonging as a relational practice that develops through everyday

routines and experiences. It incorporates complex, fluid, and often deeply emotional connections to people and place. However, the concept of belonging also calls attention to the boundaries that separate people into “us” and “them,” raising questions about how the politics of belonging (Yuval-Davis, 2006; Youkhana, 2015) are enacted through both formal modes of neighbourhood participation and more informal spatial routines.

[9:10-9:30am] Housing Disadvantage in Calgary: In Search of Structural Explanation

Ivan Townshend, Rafaela Marasco, & Tom Johnston (University of Lethbridge)

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Drawing upon the Divided Cities and Income inequality literatures, this paper explores the geography of housing disadvantage in Calgary in 2006. We focus on four research questions: 1) What are the characteristics and spatial pattern of housing disadvantage in Calgary, and does this pattern seem to correspond to the evolving geography of income inequality and income change in an increasingly “divided city”? 2) What does the literature identify as key domains of social life and neighbourhood housing and other morphological characteristics that seem to correlate with or explain housing disadvantage? 3) Is there correspondence between theoretical and empirical correlates in Calgary? 4) Which of, and to what extent do, these dimensions account for or predict housing disadvantage in Calgary? We draw upon a range of methods to explore these issues. We develop and map a composite Housing Disadvantage Index (HDI). We then identify 52 potential social indicators that may be correlates of HDI. We perform a Principal Component Analysis of the 52 indicators to identify 11 empirical dimensions of influence. Finally, we regress subject the 11 dimensions of influence against the HDI to identify the key structural drivers of HDI. Seven of these are shown to be the key predictors of HDI, and explain 74% of the variation in the urban ecology of housing disadvantage. Finding underscore the fact that the owner-renter divide (inequality) is the dominant factor.

[9:30-9:50am] The Financialization of Housing and its Impacts on Everyday Life in Brazil

Sharon Dias (University of Victoria) – sharonddias@gmail.com

What can the experiences of those living in large-scale, low-income housing projects teach us about the financialization of housing and its impacts on everyday urban life in the Global South? The present study seeks to examine this question by considering how the financialization of housing in Brazil has transformed the provision of low-income, subsidized housing in Brazilian cities. In particular, I explore the perceptions of residents in the low-income housing project, Cidade Jardim (City Garden), in the film *Cartas Urbanas* (Urban Letters). In 2010, urban residents occupied empty land in the northeastern Brazilian city of Fortaleza and demanded that the local government provide them with social housing. The government responded by constructing more than 5,000 low-income apartment units in a large-scale housing project on the previously occupied land. However, this “solution” has generated its own problems as the financialization of housing in Brazil has become a profitable means to subjugate marginalized people to the dictates of market demand. Drawing upon the seek for impacts of financialization on low income householders everyday life, this paper firstly examines the literature on financialization of housing in the Global South, focusing on the Latin America paradox. The subsequent section assesses the case of financialization of the built environment in Brazil, centering on housing policy as important components of this process. Subsequently, the narrative of householders from Cidade Jardim Housing Project showed on the film *Cartas Urbanas* (Urban Letters) will perform as concrete evidence of the impacts of financialization on subjects’ lives in the Global South. Social housing solutions are often regarded as a place that lower income people can call “home.” Controversially, many of those projects became an expression of displacement, gentrification, and neglect of low

income residents' everyday needs and rights. Recently, they are still driven by the financialization process, and have had different impacts on the urban everyday life.

D: Parks (Room 124)

[8:50-9:10am] Lowering the Drawbridge in the Castle: Geography of Disability in Castle Provincial Park

James Carnahan (University of Lethbridge) – james.carnahan@uleth.ca

A qualitative study of the geography of disability in Castle Provincial Park will be discussed. Specifically, the relationship between the geography of disability and access to amenities within Castle Provincial Park. Accessibility to campsites, hiking and fishing activities will help to demonstrate the hidden barriers for individuals with every day mobility challenges. The placement of accessible campsites in Castle Provincial park leaves room for further study. While infrastructure related to hiking and fishing revealed areas of high potential for inclusivity. The outcome of this study will provide an inclusive perspective on camping, hiking and fishing in Castle Provincial Park. It will be demonstrated that a study of the geography of disability can be applied to support an inclusive camping experience, allowing for park visitors of all abilities to enjoy the benefits of being in nature.

[9:10-9:30am] Russian National Parks in the Putin Era

Michael Tripp (Vancouver Island University) – mt4407@telus.net

Political recentralization of governmental authority in the Putin era brought with it a significant diminishment of momentum in the establishment of national parks beginning with a complete hiatus in their formation from 2000-2006. This gap can be attributed to the rapid re-ascendancy of Soviet era environmental utilitarianism promoted by newly appointed like-minded administrators – a shock therapy heralded within months of Putin's investiture by the May 17, 2000 decree #867 abolishing both federal agencies directly involved with national parks: Goscompriroda, tasked with nature protection and the production oriented Russian Forest Service within whose jurisdiction the parks resided. What is surprising, however, is that in 2007 four national parks were established followed by an additional 12 through to the present (2018) with further sites proposed. Continuing the pattern of the 1990s, the sites are diffusing eastwards and to peripheries though now fulfilling national geo-political strategies rather than reflecting earlier ambitions of regional autonomy. Significantly, despite these perceptual shifts, all of Russia's national parks continue to exist, even those declared in the midst of the turmoil of post-Soviet collapse. Their survival gives credence to the continued strength and resilience of their originators and of the purposes of the sites – as signifiers of the environmental, aesthetic and cultural/historical values with which they are imbued.

[9:30-9:50am] Small Public Urban Parks: A Systematic Review

Yashashwinee Parmar (University of Alberta) – yashashw@ualberta.ca

Because of the land requirements associated with large-scale parks, they are not always a viable option for providing green spaces in the city, and therefore are not equally accessible to all city residents. However, the effective planning of small-scale parks can improve the quality of life and livability of dense urban settings by improving residents' accessibility to natural areas. A comprehensive understanding of how to plan for and design successful small public urban parks that will provide these benefits is required to help urban planners better understand the potential

benefits of small-scale parks and underline the related planning considerations. However, current scholarship on this topic is very fragmented and an overall review is not available. This ongoing master's research project will provide a systematic review of existing scholarly research on small public urban parks. Furthermore, it will highlight areas of importance for future research on small-scale parks. The review will include peer-reviewed articles from around the world but is restricted to English publications.

E: Food & Wine (Room 125)

[8:50-9:10am] An Assessment of the Challenges and Difficulties of Farming in the Comox Valley
Stephen Hextall (Vancouver Island University) – steveyhex@gmail.com

This research aims to ascertain what the main barriers are to the further development of the agricultural sector in the Comox Valley. The agricultural sector in the Comox Valley contributes upwards of \$30 million to the economy each year, but only 18% of the ALR land available is farmed commercially. With the growing support for local food systems, and the potential for the expansion of agriculture in the Comox Valley, understanding the barriers for each sector is important. To gain a better understanding of these issues, a cross section of the farming community was interviewed, covering the market garden, produce, poultry, livestock and dairy sectors. With these interviews certain themes stood out prominently, the price of agricultural land in the Comox Valley, the cost of food production on Vancouver Island, access to sufficient water, climate change, and a lack of resources for farmers to access, being the main issues. To remedy these challenges will take a great input of time and effort, with the results needing to be comprehensive, and multifunctional. To start, increasing farmers access to district agrologists would improve the knowledge base, and have the subsidiary effect of reducing pollution and fertilizer runoff, increasing productivity, and reducing costs. The development of an agricultural college on Vancouver Island would help solve many of these issues. Increased exposure to markets, subsidies, policy adjustments, and public support will all contribute to a more successful agricultural sector incrementally.

[9:10-9:30am] Local Food Systems and Social Capital in the Okanagan, British Columbia
Chea Elton (University of British Columbia-Okanagan) – chea.aelton@gmail.com

Local food systems have become increasingly important to people (Stickel and Deller, 2014; Winfree and Watson, 2017) and now predominate as a resistance to industrial food systems in many parts of North America (Starr, 2010). Yet little is known about the impact of these systems on community social capital. The objective of this research is to understand the impact of local food systems on community social capital in the Okanagan Valley, British Columbia, where local food movements have grown in strength in recent years. This research asks the questions: How is social capital conceptualized at the community level; what are the indicators of social capital in communities where local food systems have developed; and, what are the impacts of local food systems on social capital in communities? Social capital in communities is worthy of investigation because levels of social capital relate to community's health status (Folland, 2007), community collective action (Adger, 2003) and community crime rate (Lederman et al., 2002). An explanatory case study approach using mixed methods (Yin, 2003) is used to answer the research questions in three case study cities. The strategy includes: creation of a social capital baseline using secondary sources and participatory co-creation of place-based understandings of social capital in communities using an online survey, semi-structured interviews and focus groups. This will co-create social capital impacts and indicators. Understanding the relationship between local food

systems and social capital can better equip communities to plan for local food initiatives that service community needs.

[9:30-9:50am] Impact of Environmental Imagery in Wine Labeling on The Sensory Taste of Wine

Darcen Esau (University of British Columbia-Okanagan) – Darcen.Esau@gmail.ca

The objective of this research is to understand if visual sensory cues on wine labels influence the perceived sensory taste of the wine. In particular, this research investigates the impact of landscape cues in consumer identification with wine products in the Okanagan Valley. Although there has been wine in the Okanagan wine producing region in British Columbia since the mid-1800's, the region only began to experience rapid and widespread growth in quantity and quality of wine production within the past 30 years. The 1989 NAFTA agreement, planting of vinifera varieties, and establishment of VQA standards, are often credited with this rapid growth and success in the Okanagan wine industry (Carmichael & Senese, 2012). Without long-standing traditions of wine production, new world wine regions like the Okanagan need to attract consumers that are more likely to select wine based on extrinsic features of a label, such as image and design, which become the single most important window to a wine's story (Elliot & Barth, 2014). This five-phase research study uses the framework of consumer culture theory, to identify landscape cues that aid consumers to navigate opportunities in the marketplace that provide a message that embraces who they are (Askegaard & Linnet, 2011). With increasing experience, wine drinkers create associations between cross modal sensory cues, including the environmental features on the label that connect wine to the place it is from. This forms expectations for how the wine should taste that bias the sensory experience of wine. Keywords: Landscape Identity, Wine, Consumer Culture, Human-Environment Relations.

F: Colonialism, Imperialism, & Indigenous Geographies (Room 123)

[8:50-9:10am] Acknowledging Vocal Women Q'eqchi' Land Defenders? Canadian Extractive Policy in the Age of a Feminist International Development Policy

Rebecca Ferris & Catherine Nolin (Northern British Columbia) – rferris@unbc.ca

In 2017, Global Affairs Canada announced an International Foreign Assistance Policy acknowledging impoverished women's vulnerability to various forms of violence and environmental degradation in the Global South and dedicating \$300 million to attracting investment in women-led small to medium-size businesses with the goal of empowering these women and the developing countries within which they reside. Despite this feminist approach to international aid, Canada continues to face international criticism for its support for an extractives-led approach to development through funding and advocating for the operations of Canadian resource extractive corporations facing allegations of human rights violations. This presentation examines ongoing extractives-led development operations in parallel with feminist international aid policies from Global Affairs Canada to explore their contradictory and enduring relationship. I apply critical discourse analysis to historic Access to Information and Privacy (ATIP) files covering electronic communications between HudBay Minerals Inc (HudBay), Global Affairs Canada, and Canadian Embassy staff in Guatemala to examine how Mayan Q'eqchi' women land defenders are acknowledged or described during instances of mining conflicts related to HudBay's Fénix mining project in El Estor. This analysis of how each of these Canadian 'development actors' communicate with one another may also draw out a more illustrative understanding of broader transnational relationships involved with the violent impacts of natural resource extractive

projects and how they pose challenging contradictions to the feminist narrative of Canada's latest foreign aid policy.

[9:10-9:30am] “The Past is Never Dead”: Imperialism and International Adoption in Guatemala
Sarah Brown (University of British Columbia) – sarahb79@hotmail.com

Histories matter to the present. In tracing the fraught trajectory of international adoption in Guatemala, the country's colonial and imperial histories come up again and again. In 2008, Guatemala's privatized international adoption system was abruptly shut down over widespread evidence of “irregularities”, including the bribery and coercion of birth parents. International adoption was wildly popular before the shutdown, with most children heading to adoptive families in the U.S.A. During my research on this topic, stakeholders agreed that the practice of international adoption and the problems that brought it to an end are never separable from Guatemala's colonial and imperial histories. Ann Stoler's book *Duress* (2016) seeks to articulate the complexities of how colonialism shapes contemporary social worlds, what political consequences it carries, and through what vocabularies it is expressed. Stoler names as “recursive” the ways that colonialism emerges and constrains what is possible. She argues that colonial logics and practices can seemingly disappear only to (“recursively”) resurface later in altered form, allowing them to endure. For Stoler, the flexible qualities of colonial logics and practices allow them to (re-)emerge in the form of seemingly “new” social problems. I bring Stoler's insights to bear on the story of international adoption and trace the colonial-imperial recursivities that shaped this practice into one that was wildly popular, market-based, and propped up through (racialized and gendered) violence. The conditions of possibility for international adoption in Guatemala were set long before the practice came to be, and the power of its colonial and imperial dimensions continues to endure after international adoption's demise.

[9:30-9:50am] Forest Gardens and Clam Beds: Production of Space by the First Nations People of the Pacific Northwest
Adrian Smith (Northern British Columbia) – smithadrian@me.com

The arrival of British explorers in the seventeenth century to the Pacific Northwest coast precipitated the annexation of the new lands, and the to the near annihilation of the indigenous peoples. The land that is now known as British Columbia was claimed on behalf of King George IV and the native people were dispossessed of title to their native lands. To justify the annexation, the Crown sought legal apparatus to legitimize its appropriation of title to the lands. The notion of *Vacuum domicilium* (Latin: empty dwelling) provided the legal argument that lands devoid of agriculture, and the boundaries, or fences that agriculture creates, was sufficient to declare the land free of ownership. However, the First Nations people of the Pacific Northwest had been partaking in agriculture and mariculture for millennia prior to European contact. This paper explores how the design, construction, maintenance management and harvesting of forest gardens and clam beds, through the lens of Lefebvrian theory of the Production of Space, refutes the notion of *Vacuum domicilium*.

G: Resource Management in Asia (Room 130)

[8:50-9:10am] Situating ‘peak water’: Lived Experiences of Glacio-Hydrological Change in the High Mountains of Nepal
Graham McDowell (University of British Columbia) – grahammcdowell@gmail.com

Peak water describes the hydrological response of glacier fed rivers to climate change, indicating that warming first drives increasing discharge until a glacier melt threshold is surpassed and discharge falls below pre-climate forcing values. Although the physical principles of peak water are well understood and accepted, there remains little empirical work evaluating what peak water means for residents of high mountain communities at the frontlines of glacial change. In response, this study—drawing on 80 household interviews, 15 key informant interviews, and 2 focus groups—characterizes lived experiences of peak water in two remote communities in the upper Manaslu region of the Nepal Himalaya. The study region is expected to experience increasing discharge until at least mid-century, a situation identified in the literature as being of low immediate concern compared to regions such as the Peruvian Andes, which are already experiencing declining discharge. Given a paucity of existing hydro-meteorological data, the study first draws on residents' perceptions of hydrological change to characterize local watershed dynamics, focusing on changes in socially-relevant sources of water. It then evaluates how and why these changes are disrupting livelihoods before examining local attempts to ameliorate harm. Contrary to the literature, the study identifies significant vulnerabilities related to peak water dynamics; namely, reduced drinking water quality due to increasing sedimentation as well as threats to life and property due to hydro-meteorological variability and extremes. These vulnerabilities emerge at the intersection of complex social-cultural and glacio-hydrological realities and indicate the importance of situating peak water dynamics in specific socio-ecological contexts. The presentation concludes by discussing locally-identified adaptation options and needs as well as lessons learned for future research.

[9:10-9:30am] Waste Pickers in Dhaka city, Bangladesh: A Sustainable Livelihoods and Health Assessment

Sayed Mohammad Nazim Uddin (presenter), Jutta Gutberlet and Anahita Ramezani (Asian University for Women, University of Victoria) – sayed.uddin@auw.edu.bd

Waste pickers make a livelihood by collecting recyclable waste from various places in low, middle and high-income countries. They contribute significantly to urban sustainability, resource recovery and provide an income for themselves. Worldwide, waste pickers are the excluded group of the waste recycling system. Generally, they are poor, marginalized and vulnerable to various kinds of occupational health problems and diseases, as well as many other risks and shocks. This study applies a mixed methods approach in Dhaka, Bangladesh to learn about current health and livelihood issues of waste pickers in one of the most densely populated cities in the world. We adopt the original sustainable livelihood framework to analyze the multifaceted aspects of the waste pickers' everyday life and work experiences. We added the political assets aspect to the framework to contemplate governance trends, shocks and assets. The framework is suitable because it takes an integrative and transdisciplinary approach to livelihood assets and vulnerabilities. Our findings reveal a situation of extreme poverty and neglect that afflicts this vast population that with their daily work reclaims resources and helps make cities more sustainable and communities more livable. Intrepid strategies and actions are urgently needed to improve the current livelihood situation of the waste pickers and to make city environments better and more inclusive, in view of global environmental and climate change.

[9:30-9:50am] Examining the Characteristics, Spatial Patterns, and Priorities of Small-scale Fishers: A Philippines Case Study.

Nikki Beaudoin (University of Victoria) – lee6nikki@yahoo.ca

Small-scale fisheries (SSF) are vital to the livelihoods and manage SSF and can lead to inequitable conservation and management outcomes which are poorly supported by fisher stakeholders. This paper demonstrates how robust datasets on SSF that include information on

spatial distribution, priority areas, and characteristics of different fishing methods can provide useful insight on the needs and priorities of SSF. Participatory mapping exercises were conducted in ten coastal communities in the municipality of Padre Burgos, Philippines to document the local knowledge of small-scale fishers. Results showed that the spatial patterns, gender profile, and reasons for fishing varied amongst fishing methods and communities. Priority areas were generally located near shore and were more prominent for near-shore fishing methods than offshore methods. Three common factors influencing fishers' choice for selecting priority areas were abundance of catch, proximity to barangay, and habitat type. These insights into the characteristics and priorities of SSF are invaluable for fisheries management, by examining how different management options are likely to affect different fisher stakeholder groups and their communities. The study is a rare example of a complete and robust dataset of the spatial patterns, priorities, and nature of SSF, and highlights the value of utilizing the local knowledge of fishers to inform management outcomes that are more effective, equitable, and considerate of the needs and values of local people.

Break & Poster Sessions 9:50am – 10:30 am

Poster Sessions (Lobby)

[10:00-10:30 am] Poster Session (*see below for poster listings*)

Morning Sessions II (10:30am – Noon)

A: Panel discussion - Out There Learning (Room 116)

[10:30am-12:00pm] Panel Discussion and Book Launch: "Out There Learning: Critical Reflections on Off-Campus Study Programs"

Chair: Helga Thorson & Cameron Owens (University of Victoria) – camo@uvic.ca Panelists: Deborah Curran (University of Victoria), Matthew “Gus” Gusul (Government of Alberta), Elaine Meyer-Lee (Agnes Scott College), Kacy McKinney (Oregon Health and Science University), Nakanyike Musisi (University of Toronto), Elizabeth Vibert (University of Victoria) & Aaron Williams (University of Calgary)

Geographers and other scholars have long celebrated the benefits of students getting out of the classroom and into the field to learn. Off-campus programs are widely celebrated for providing enjoyable, immersive, experiential, relational, and place-embedded learning. However, there has been little critical analysis of the benefits and challenges of teaching and learning in the field. Over the past three years, researchers from around North America, with a core based at the University of Victoria, have undertaken studies of off-campus programs exploring the unique pedagogy, place-based ethics, and challenges in assessing such teaching and learning. We recently published our findings in an edited volume *Out There Learning: Critical Reflections on Off-Campus Learning* (2019: U of Toronto Press). In this session some of the authors will reflect on their research in a panel format, responding to the following questions: In a nutshell, what did your research reveal about field school teaching and learning? What are the important differences between classroom and field course learning? As instructors, how does your duty to students and the communities with which you work potentially conflict? How do you navigate those conflicts? How do you unpack with students their interpretations of the communities they visit (i.e. so that they can challenge their preconceptions about the place or what is going on)? What is the one most

important lesson you have learned about field teaching and learning that would be valuable for current or future field school instructors?

B: Climate & Landscape Dynamics I (Room 104)

[10:30-10:50am] Climatic Influence on Bog Evolution in the Oil Sands Region, Alberta

Ashlee Mombourquette & Laura Chasmer (University of Lethbridge)
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Ecosystems are influenced, in part, due to inter-annual climate variability such as air temperature and precipitation patterns. How these climatic patterns vary can cause some ecosystems to transition from one state to another state. This study investigates the extent to which climate variations coincide with changes in bog extents in the Oil Sands Region north of Fort McMurray between the years 1980 – 2017 using Landsat images and climate data. A supervised classification was done on the Landsat images to determine bogs, fens, and all other land cover classes over three discrete time intervals, 1984, 1999, and 2015. Average annual air temperature has increased by almost 2°C in the 2010 to 2017 period compared to a baseline average from 1980-1989. During these two periods, average summer and winter air temperatures increased by 1.5°C and 1.7°C. While precipitation (P) decreased on average from 424 mm during the 1980's to 397 mm (2010s). Hamon's temperature-based potential evapotranspiration (PET) model was used to determine PET, which is used to calculate aridity (PET-P). From 1981 - 1989 and 2010 – 2017 average aridity of the landscape has increased, such that 116.25 mm more water is lost to the atmosphere during the 2010's than occurred during the 1980's. A combination of factors may have led to the drying of many bogs in the study region, in turn influencing species composition. Fens also appear to be slowly transitioning into bogs, and bog appear to be transitioning into treed ecosystems. Thus, climatic patterns seem to be a factor influencing the evolution of bogs in the Oil Sands Region, Alberta.

[10:50-11:10am] Modelling Future Climate Change-Driven Landscape Degradation in Areas Underlain by Permafrost, Yukon Territory, Canada

Oliver Kienzle (University of Lethbridge) – oliver.kienzle@uleth.ca

With climate change being a present and future reality, communities and industries in the Canadian North need to be able to plan ahead with regards to environmental change. Permafrost thaw and the associated generation of thermokarst landscapes will negatively impact a broad spectrum of stakeholders. The distribution and severity of this phenomenon is unknown. Due to the remoteness of the affected areas, in-situ assessment of this issue is unrealistic. To combat this issue, I am assembling a model which identifies so-called 'soft-spots': areas underlain by permafrost which are, to varying extents, vulnerable to thaw and the generation of thermokarst landscapes. My study area is the Yukon Territory, chosen for the presence of multiple permafrost zones, ecosystems, and geomorphologies. The model incorporates soil morphology, vegetation, DEM-derived terrain variables, current and forecasted climate, and forest fire data in a GIS to produce an index of susceptibility to permafrost thaw and associated landscape degradation in the form of a 250 m raster surface. One of the strengths of this model is the limited amount of data that it requires, allowing it to be applied to most high-latitude regions of the world. Validation of the model will be accomplished using permafrost ground truth points collected across the Yukon in the past decade. Ultimately, it should provide invaluable information to assist governments, industries, and residents in mitigating and preventing climate-forced inconveniences, accidents, and disasters.

[11:10-11:30am] Characterization of Surface Air Temperature Phenomenon within the West Castle Watershed, Alberta

Kyle Bexte (University of Lethbridge) – kyle.bexte@uleth.ca

Mountainous regions represent a geographical confluence of earth-atmosphere systems, ecology, physical processes, and human interests. The local climate within these regions is often difficult to study and inferences are made as to how surface air temperature manifests itself. Currently existing climatic models over mountains infer fixed surface lapse rates (SLR) over different seasons and landforms. As a result, in mid-latitude mountains this can often lead to significant errors in predicted temperature as the presence of inverted SLR can be prolific especially in the winter months. There is a lack of spatial knowledge in respect to local climate phenomena that occur within the Castle Watershed of Southern Alberta. To further improve our understanding of the current climate and the impacts of climate change, it is imperative to collect climatic data and model these phenomena at higher. To this end, identifying the deviation of SLR within the watershed from broadly assumed fixed SLR within these regions will provide a more concise understanding of temperature across this and similar regions. This work is unique in that it attempts to create a working near-surface air temperature model for the Castle Watershed that, in conjunction with accepted climate evolution models, can be used to extrapolate the future and the past climates for this area. The overall goal of this research project is to model and identify spatial and temporal surface climate variables and how they relate to various biotic and abiotic components of the watershed providing a basis for further study.

[11:30-11:50am] Selectivity of Cattle for Crested Wheatgrass in the Dry Mixed Grass

Kyla Rushton & Jenny Burke (University of Lethbridge) – kyla.rushton@uleth.ca

Native prairies are prone to invasion by Crested Wheatgrass (CWG) which is of poor forage value to cattle and it is difficult to control in heterogeneous rangelands. In this study we a) quantify selectivity of cattle for CWG and determine if it is significantly different from mowed CWG or native vegetation; and b) determine if species richness in CWG communities changes significantly over time with grazing. Data was collected by GPS collars worn by cattle for a period of May-August in 2016 at Antelope Creek Habitat Development Area, a research ranch west of Brooks, Alberta in a Dry Mixed Grass ecological region. Spatial utilization by cattle was overlaid with a detailed plant community map to determine forage value indices for different types of vegetation. Statistical results indicated that there was up to 48% higher selectivity for CWG rather than native grass and there was no significant difference in the selectivity of cattle for mowed or unmowed areas of CWG. Grazing resulted in a 52% increase in native species within CWG communities. This study suggests that dense abundant plant residue (litter) associated with CWG may not be adequately mitigated by a mowing treatment. Over time grazing may promote native species establishment within CWG communities. Intense and early season grazing of CWG may be used to reduce CWG in patchy rangelands.

C: Urban Environmental Management (Room 108)

[10:30-10:50am] Urban Wildlife Population Management

Wylie Fuller (University of Victoria) – wylie.fuller@gmail.com

Wildlife management in urban areas is needed to reduce human-wildlife conflict and maintain and restore damaged and fragmented ecosystems. Columbian black-tailed deer

(*Odocoileus hemionus columbianus*) inhabit urban and rural landscapes and may be increasing in density in urban BC. Municipal governments are investigating methods of estimating population densities, modifying landscapes to deter deer, and reducing population densities. This study is part of a research project by the Victoria Urban Wildlife Stewardship Society (UWSS) and Dr. Jason Fisher (Environmental Studies, UVic) to monitor Columbian black-tailed deer in Oak Bay, BC, and assess the effect of management actions. This research estimates deer population densities in Oak Bay, evaluates resource and habitat selection, offers recommendations for population reduction, and will investigate demographic responses to immunocontraception over a 2-year period. I estimated home ranges for 20 collared deer in the fall, and am developing resource selection functions for these deer this spring; this research provides baseline population density and behaviour estimates for monitoring responses to immunocontraception in fall 2019. I am also conducting a literature review on protocols for monitoring for urban deer and strategies for reducing populations. During this presentation, I will discuss GIS/geoscience methods of monitoring wildlife, present results of home range and resource selection analysis, and share recommended protocols monitoring and managing urban ungulates and their limitations. I participate in ecological restoration around Victoria and will describe how deer management can assist habitat and species conservation in fragmented, urban landscapes.

[10:50-11:10am] Stormwater Management

Brandon Makar (Thompson Rivers University) – brandon.makar@shaw.ca

Stormwater management is becoming more and more relevant in cities across the world, as the effects from climate change have begun to be felt. This paper examines existing stormwater management practices mostly in the United States and Canada, (however these practices are used around the world), as well as examining the different types of infrastructure beginning to be used for stormwater management such as green and blue infrastructures. Considering most studies on stormwater management are usually focused on larger cities, this text will include a small section on how a small city, (Kamloops, British Columbia) currently manages its stormwater, and how it can update its tactics to adapt to the ravages of a warming earth. The text also examines the literal and environmental costs of the different types of infrastructure, and how they are received by the public, as people have stakes in the existing infrastructure, which is primarily grey. Currently, there is not much information surrounding blue infrastructure, as it is a new tactic for adapting/mitigating increased stormwater levels; this paper includes a substantial section on blue infrastructure and how it can be integrated with the current stormwater infrastructure without the cost of replacing it. The conclusions of the research are that there needs to be a larger amount of reliable studies on green and blue infrastructure, so the public can see past the dollar amount and cities can convert to a much more environmentally friendly stormwater management system.

[11:10-11:30am] Urban Heat Islands: What Their Effects Are, and How to Mitigate Them

Claire Irvine (Thompson Rivers University) – claire.irvine@outlook.com

Urbanization is changing the way thermal energy is absorbed and emitted by the Earth's surface. The spread of urban infrastructure has led to an increase in impermeable, low-albedo surface features and loss of vegetation. These factors combined have contributed to increases in temperatures over urbanized areas creating a "heat island". This paper reviews literature concerning Urban Heat Islands (UHIs): the factors which create them, the impacts they have on populations and the environment, and ways in which the phenomenon may be mitigated. The literature review has revealed mitigation strategies which have been or may be leveraged to combat UHI. These include urban greening; green roofs; increasing surface albedo; alterations in geometric form, aesthetic design, and/or orientation of buildings; permeable surfaces, such as roads and parking lots; and harnessing natural winds to increase the ventilation of urban heat.

Urban Heat Island mitigation strategies can improve citizens' quality of life (i.e.: greening, park space, cooling, pollution reduction), and reduce the effects of climate change on urban cores (i.e.: decrease rising temperatures, reduce poor air quality, carbon sinking through introducing green space).

[11:30-11:50am] The Potential for Sustainable Recreation Development in Burns Bog

Pavenjot Bhatia (Vancouver Island University) – pavenjot@gmail.com

Commonly referred to as the “lungs of the lower mainland”, Burns Bog provides numerous ecological services for Vancouver. The bog is also a valuable part of the heritage of various indigenous tribes. The nearby Delta Nature Reserve is the only part of Burns Bog that is currently open to the public. The Burns Bog Ecological Conservancy Management Plan aims to develop “public education and sustainable recreation as cultural opportunities” via community engagement, education, and best design principles. Issue: Since the rest of the bog is closed off to the public as an Ecological Conservancy Area (ECA), research is yet to be undertaken to determine how the public can access the bog without causing damage. What opportunities exist for sustainable recreation development in the remaining parts of the bog? How can these activities benefit locals and tourists while maintaining the ecological integrity of the bog? Using existing wetland tourism case studies and local trends, this paper seeks to explore some options and future design principles that may enhance sustainable recreation development in Burns Bog. Findings: (1) Well managed wetland tourism can be economically, culturally, and environmentally beneficial for both tourists, locals and the ecosystem. (2) Strategically built trails, boardwalks and guided tours may allow tourists to experience the natural wonders of the bog while raising more awareness for conservation and future research endeavors Conclusion: There is significant potential for sustainable recreation development in parts of Burns Bog, which may benefit conservation efforts and the local tourism industry.

D: Geographies of Health & the Body (Room 124)

[10:30-10:50am] Embryo Ecologies and the (re)production of Healthy Bodies

Juliane Collard (University of British Columbia) – juliane.collard@geog.ubc.ca

In vitro fertilization has precipitated a vital respatialization of reproduction. Once confined to the womb, early embryo development now occurs readily and with increasingly high success rates outside the body, opening up the biology of fertility to flexible spatial possibilities. Geographers have examined the extensification of reproductive networks that has ensued, following eggs, sperm, and embryos between bodies, across borders, and around the world. But IVF has equally wrought a geographical intensification that has received far less attention. The ability to remove human embryos from the spatial and temporal constraints of the body has granted science and capitalism unprecedented, if always incomplete, access to the concrete space of the embryo, rendering ‘life itself’ increasingly open to intervention. Today, human embryos are studied, manipulated, experimented with, and commercialized in previously impossible ways. These technoscientific interventions in ex vivo embryo ‘ecologies’, I argue in this paper, have generated powerful biomedical knowledge about the healthy bodies we are supposed (to want) to have and reproduce – able-bodied, neuro-typical, long-living, sexually dimorphic. But it has also rendered this biomedical knowledge material – for example through embryo selection practices that result in the discarding of ‘abnormal’ embryos – with significant implications for our socio-biological futures. Drawing on fieldwork conducted in California’s biotechnologies and reproductive medicine sectors, this paper situates the ex vivo human embryo as a key site in the

production and materialization of embodied health knowledge, one deserving of careful and critical analysis by human geographers.

[10:50-11:10am] Examining Telegeriatrics in Northern Rural British Columbia

Georgia Betkus & Shannon Freeman (Northern British Columbia)

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Over the last several years, there has been a call for innovative services to overcome geographical barriers to access and deliver health care in rural communities. As Canada's population ages at a rapid rate – and remains in place as it does so – these types of services are more important than ever. In northern British Columbia, the Geriatric Outreach program has been introduced to offer specialized geriatric care to rural seniors who would otherwise have to travel great distances for this type of care. As part of this service, telegeriatrics connects seniors in rural communities with geriatric specialists positioned in urban centres through videoconferencing technology. Although this service has been in place for a few years, the effectiveness of this service is not well understood and there are a number of seniors who still receive follow-up care in-person despite the availability of the virtual connection. The goal of my research project is to determine the impact of the telegeriatric service by examining the difference between those who receive in-person follow-up care and those who receive follow-up care via the telegeriatric service. This oral presentation will place telegeriatrics in the context of northern British Columbia, highlight the research methods and methodology for this work, and finish with the real-life applications of this research.

[11:10-11:30am] The Hypocrisy of Geographic Regulation and Consumption: A Study on Marijuana vs. Cigarettes

Peyton Bradley & Colt Gnech (Vancouver Island University)

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Assuming the legalization of marijuana is the most necessary federal development in Canada in this day and age, putting aside pressing dilemmas such as establishing a proper foster care resource system, or dealing with the never-ceasing housing crisis taking place all over Vancouver Island. It is fair to admit that Canada benefits thoroughly from the legalization of marijuana. The once black-marketed drug now can run rampant in the Canadian cities and can be accessible to those who are of legal age. In retrospect, this sounds all too familiar. Nicotine, the sister smokable substance found in cigarettes, has been legal for as long as history goes on for. However, you do not see the same regulations for cigarettes as you do marijuana. No, cigarettes do not induce mind-altering effects after the usage but that is not what the Canadian government was concerned with during the legalization debate. The government was more or less concerned with the health impacts and how the legalization of marijuana would impact our youth by being smoked publicly. Upon presentation of this paper, we will be discussing the regulations behind both substances, and affirming the controversial argument that cigarettes have become so mainstream they can be smoked almost anywhere without any legal consequences, whereas smoking marijuana has become almost too regulated to the point where it seems that being caught with it in a public place is a straight path to your local jail. This hypocrisy is new to Canada and is already being called out after these last few short months of it being regulated. Through a closer look into the geographic locations where marijuana can be sold and consumed, we can see clear hypocrisy to the attitude towards cigarette distribution and consumption.

[11:30-11:50am] Children's Health, Environmental Policy & Climate Change: Reframing Issues to Improve Policy & Governance of Natural Resources

Climate change is becoming a local problem to an increasing extent and needs more attention when potential impacts of resource extraction projects are assessed. For instance, climate change associated excessive rains caused flooding of old tailings ponds at mining sites in Wales, leading to lead toxicity 82 times above legally acceptable levels. The increased lead toxicity killed cattle downstream from the mines, but there was no discussion about potential long-term impacts on local vulnerable populations. From the developmental origin of health and disease (DOHaD) perspective, ignoring potential health effects of climate change on children can have potentially devastating impacts on communities. In the United States, children's environmental health has been a central focus of the Environmental Protection Agency (EPA) since 1997, but that is not case in Canada. The ways in which environmental challenges are framed influences the focus of collective attention and how we choose to act on environmental matters. Institutional framing of environmental questions plays a particularly important role in determining which issues get prioritized. If an issue does not reach the agenda in the first place, policy change cannot occur. A document analysis revealed that, in Canada, attention to potential long-term effects of natural resource extraction projects on children's well-being, such as increased poverty, food insecurity, and poor water quality, is detrimental. The findings highlight a need to explore alternative issue framings for better environmental impact assessments and consequent decision-making. Geographies of children's environmental health deserve much more attention in environmental policy and decision-making contexts in Canada.

E: Workshop - Humanitarian Mapping (Room 125)

[10:30am-12:00pm] Humanitarian Mapping with MapUVic

Facilitated by Gabby Zdrazilova and Trenton Horsley (University of Victoria)
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USAID and OpenStreetMap Foundation have created the opportunity for any person with an internet connection and access to a computer to create geospatial data needed for humanitarian efforts. This includes the creation of building and road features to aid evacuation efforts in wake of natural disasters where technology to map is not normally available. The goal of this workshop is to provide participants with the opportunity to learn how to use "ID-Editor," an intuitive and useful GIS application, to contribute bulk data to servers in order to help people by creating maps. This 75-minute workshop will empower the participant with the skills to conduct mapping on their own even after the conference. It is accessible for those with no prior experience using a GIS, as well as engaging for those with GIS experience who want to learn a novel application targeted at humanitarian aid. Having trained as interns for USAID, Gabby Zdrazilova and Trenton Horsley are knowledgeable and prepared to teach. Thus far, the "MapUVic" club has hosted six "Mapathons" on campus in the past 2 years, and presented to an introductory geography class where students were engaged in a low-pressure educational setting. The proposed format is a 30-minute PowerPoint tutorial followed by a 45-minute free mapping session where Trenton and Gabby will assist participants individually with their questions. Those interested must bring a laptop and a mouse in order to participate. A more accessible setting includes holding the workshop in a computer lab instead of a lecture hall, as we cannot provide laptops.

F: Workshop - Reconciliation is a verb (Room 123)

[10:30am-12:00pm] Reconciliation is a Verb: A Sharing Space and Decentralized Workshop Focused on Decolonizing our Departments, our Research and Ourselves

Facilitated with Matt Fuller, Paige Bennett & Tyler Blackman (University of Victoria)

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In 2015, the Truth and Reconciliation Commission (TRC) of Canada released its final six volume report. Alongside the report, the TRC delivered 94 calls to action for governments, educational and religious institutions, civil society groups and all Canadians to respond to. Across Canada, many departments and faculties have begun to answer these calls and respond more broadly to a growing need to decolonize the culture, barriers and pervasive hegemonies of the contemporary University. A quick survey of the breadth and depth of these processes, though, suggest that they are not as far along or robust as they could or should be, even in our own departments. As geographers, we have a particularly visceral connection, centuries old in the making, to the violence of colonization, empire and imperialism, a relationship that is amplified in Canadian historical and present-day contexts. Using the TRC as a framework for dialogue, this workshop seeks to bring together scholars and students to discuss questions around how we can further a decolonizing agenda in our professional and personal lives that is embedded with substance and solidarity. Recognizing that we each come from different places along this path, with varying degrees of progress in the face of distinct institutional barriers, this workshop seeks to be a sharing space for us to learn from one another and spark meaningful action. Can geography reconcile its intimate connections with empire and imperialism as it engages in the necessary processes of reconciliation and decolonization? How do we recognize our own agency, privileges and power in advancing these processes? What should allyship and solidarity look like for us?

G: Geographies of Economic & Social Capital (Room 130)

[10:30-10:50am] Exploring the Edges of Evolutionary Economic Geography

Patrick Brouder (Vancouver Island University) – patrick.brouder@viu.ca

Evolutionary Economic Geography (EEG) has been promulgated as a powerful explanatory paradigm for understanding change across the spatial economy. Outputs from empirical studies have been rapidly emerging in recent years and reflective epistemological debate has also occurred. While the epistemological debate has received much attention, the empirical studies have not shown much interest in exploring the ontological boundaries of this emerging research field. This paper reviews the extant literature to highlight the lack of academic enquiry into these boundaries. It is clear that the main proponents of EEG aspire to explain why the entire spatial economy looks like it does and yet there remains a focus on high-technology industries and the knowledge economy in empirical studies. This raises questions as to the limits of the EEG paradigm, i.e., in aiming to progress knowledge on the entire spatial economy it should also be cognisant of other sectors even if they are not high-growth areas, e.g., low-technology services and more community-focussed development since the long-term evolution of these areas is not explained by their relationship to the high-tech sectors. The paper concludes that EEG scholars and other geographers should redress the imbalance by engaging in more diverse empirical studies and by taking the epistemological debate to the boundaries of the EEG paradigm thus embracing new ways and spaces of knowing.

[10:50-11:10am] A Regional Analysis of Canadian Per Capita Construction Investment Trends: 1995-2015

Robert Mahnic (Monarch Business School Switzerland) – robert.mahnic@umonarch-mail.ch

The focus of this research was twofold: first, to assess the quality of a Statistics Canada data set, and second, to conduct a multi-variate analysis of that data set to examine spatial and temporal trends in per capita construction investments. The spatial scope includes the ten Canadian provinces and three northern territories, and the temporal scope was limited to the 1995-2015 period. The research was completed using a five-stage process. First, Statistics Canada construction data was assessed for completeness. That assessment identified missing data concerns. Data for the three northern territories was combined and the analysis used the highest level of non-missing data. Research hypotheses were formulated at stage two and the third stage consisted of the descriptive statistical analysis. In the fourth stage, an analysis of variance tested differences in the means of the dependent variable, per capita provincial-territorial construction investments, and confirmed there are significant differences ($p = 0.001$). In the final stage, a multiple linear regression analysis was completed. The independent variables – mortgage rates, a stock market index and crude oil prices – were used in a model to explain Canadian regional per capita construction investments. The regression models were significant ($p = 0.001$) for each of the 11 spatial units. The adjusted R^2 values for each model ranged from 58.3% to 94.4%, with an average R^2 of 77.3%. Analysis of residuals from the regression models indicates the potential for temporal bias: regional per capita construction investment trends may be lag-responsive to national or global economic changes.

[11:10-11:30am] A Co-operative Venture: The Canadian Wheat Pool and the Canadian Wheat Board

Linda Bracken (Vancouver Island University) – lrbracken@shaw.ca

Co-operative venture such as the Canadian Wheat Pool and its board have impacted Canadians in the area of food security, global and national economics and from a social capital perspective. Historically, cooperatives have played a role in nation building impacting the distribution of family farms. Bill C-18 dismantled the historic Canadian Wheat Pool's (est. 1923) monopoly by dismissing the Canadian Wheat Board (est. 1918 & 1935) impacting Canadians judicially, economically and socially. Trade agreements such as the 1994 General Agreement on Tariffs and Trade (GATT) provided the opportunity to pass Bill C-76 which eliminated the WGTA and the Crow Benefit dumping the cost of freight on farmers. The geographical location of Great Plains Region of Canada influenced the Canadian Wheat Pool and its board through its purposes and objectives as a pioneering marketing mechanism. The Canadian Wheat Pool and its marketing board enhanced capital by directly impacting natural/physical environments and societal conditions affecting community wellbeing. This monopoly was initially created by the United Farmers Party of Manitoba to help farmers bargain collectively. The ramifications of the loss of this institution could have a profound effect on our food purity and economic ability to manage our own resources in a globally competitive world, which is not known to hold environmental concerns in high regard. Motivating current populations to consider the ramifications of the consequence of complacency may redirect their creativity toward ethical consumerism and an enhanced bridging of social capital. Environmental change may involve reframing and redefining our capitalist worldview and values.

Lunch Break, Poster Sessions & Special Sessions 12:00 pm – 1:00pm

Panel Discussion: Jobs for Geographers (Room 116)

[12:15-12:50pm] UVic Alumni roundtable on “Jobs for Geographers” facilitated by Bronwyn Harvey (Victoria)

WDCAG Executive Meeting (Room 128)

[12:15-12:50pm]

Poster Sessions (Lobby)

[12:30-12:50pm] Poster Session (*see below for poster listings*)

Afternoon Sessions 1:00pm-2:30pm

A: Panel Discussion: Who Transforms Who? (Room 116)

[1:00-2:20pm] Who Transforms Whom? Celebrating the Reciprocal Potential of Learning

Chair: Teresa Dawson (University of Victoria) – tdawson@uvic.ca Panelists: Hanny Buitenwerf, Theresa Dearden, Jack Nyren, Colin Saint-Vil, & Taliya Steidman-Wright (University of Victoria).

Geography has a long history of aspiring to transformative pedagogies as well as a deep commitment to community engaged learning. What happens when the two intersect? How do our transformative pedagogies appear in the reality of community engagement? In this case, what happens when (intersectional) feminist pedagogies are applied to a course whose specific learning goals include de-colonising the mapping process? What (if anything) changes and how do we know? Using our department’s newly regularised course on “community-based mapping,” we (the authors) embarked on simultaneously re-imagining and re-practicing the learning experience. We have undertaken, amongst other intersectional approaches, glocal networking, reflective journaling, intentional destabilisations of power relations amongst teachers and learners, the acknowledgement and celebration of learning places, attentional listening, game development for enhancing conversations, empathy training, being fully present in community and gifting our learning (but not others’ teaching). Our goal in this session is to share our diverse stories of personal transformations in learning, which go far beyond the original community engaged course goals pertaining to community-based mapping and include deeper respect for global citizenship, engagement with feminist theory, understanding of religions other than one’s own, desire for international connections, empathy for the immigrant experience, knowledge of self and values, confidence in one’s personal ability to contribute, awareness of the context of indigenous peoples, and desire and motivation for future learning and career development. We welcome the chance at the session to learn from anyone currently engaged in trying to implement their transformative pedagogical goals in a community engaged context.

B: Climate & Landscape Dynamics II (Room 104)

[1:00-1:20pm] Local Scour Around Two Side-by-side Cylindrical Bridge Piers Under Ice-covered Conditions

Mohammad Reza Namaee (University of Northern British Columbia) - mnamaee@unbc.ca

In the current study, 108 flume experiments with non-uniform, cohesionless sediments incorporating four pairs of side-by-side cylindrical bridge piers have been done to investigate the local scour process around four pairs of side-by-side bridge piers under both open channel and ice-covered flow conditions. Similar to local scour around bridge piers under open channel conditions and a single bridge pier, it was observed in the experiments that the maximum scour depth always occurred at the upstream face of the pier under ice-covered conditions. Further, the smaller the pier size and the greater the spacing distance between the bridge piers, the weaker the horseshoe vortices around the bridge piers, and, thus, the shallower the scour holes around them. Finally, empirical equations were developed to estimate the maximum scour depth around two side-by-side bridge piers under both open channel and ice-covered flow conditions.

[1:20-1:40pm] Utilizing Melt-Pond Fraction to Analyze Spatial and Temporal Sea-Ice Melt Patterns in the Canadian Arctic Archipelago

Josh Tawse (University of Victoria) – JP_Tawse@hotmail.com

Arctic sea-ice extent has been declining for several decades, with remote sensing acting as an important tool in trend analysis since late 1978. This research looked at whether using melt-pond fraction was a suitable proxy for sea-ice melt. This was completed using MODIS imagery, sea-ice charts, melt-pond fraction raster files, and monthly mean temperature between 2009 and 2017 over the Canadian Arctic Archipelago during the summer melt season. To improve data resolution and under the assumption that analysis of the region as a whole would not be representative of individual areas, four sub-regions were created. Preliminary research discovered 2013 to be an anomalous year resulting in a positive sea-ice trend; data collected confirmed this discovery and as such, analysis and discussion were completed both factoring and removing the year to determine its effect. The complexity of the region and the many factors that contribute to extent loss resulted in melt-pond fraction being determined to not be a valid primary indicator for estimating sea-ice melt.

[1:40-2:00pm] Assessing the Climatic Sensitivity of Douglas Fir in British Columbia, Canada

Lauren Farmer (University of Victoria) – laurenfarmer@uvic.ca

Effective adaptation of forest management practices to climate change will require a good understanding of the ecological and climatic factors influencing tree sensitivities and responses to climate. Using tree-ring data collected from stands of Douglas fir (*Pseudotsuga menziesii*) spanning a wide climatic range in British Columbia (B.C.), Canada, we present an approach using traditional dendroecological analyses to quantify relationships between population climate-growth sensitivity.

[2:00-2:20pm] Dendrochronological Investigation of Western Hemlock (*Tsuga heterophylla*) in Blaauw Eco-Forest, Langley BC

Samit Sandhu & David Jordan (Trinity Western University) – DavidJ@twu.ca

Western hemlock (*Tsuga heterophylla*) are shade tolerant trees that occupy many forest sites in the coastal western hemlock (CWH) biogeoclimatic zone, including bog and remnant bog habitats. The Blaauw Eco-forest is a 14.2 ha. parcel of protected second growth CWH forest comprised of mixed coniferous and deciduous vegetation including a small pond/wetland complex and a suspected remnant peat bog. This oral presentation describes recent research that forms part of a larger study investigating the spatial dimensions of western hemlock radial growth in the Blaauw Eco-forest. Forty increment cores were extracted from 20 trees within a 15 m radius plot located in the northeast sector of the property in the remnant bog. To create a site-specific tree-ring

chronology, canopy dominant trees were selected to enhance the common growth signal and to reduce the effects of competition. Thirty-five core samples were successfully crossdated to create a chronology that spans 108 years, from 1911-2018. Distinct marker rings were identified on nearly all the cores representing a synchronous response among the stand to a common growth signal. The significance of the signal was supported by a good inter-series correlation of $r=0.413$, $p < 0.01$. The tree-ring chronology showed periods of suppressed growth around the years 1958, 1966, 1974, 1989, 1991, and the early 2000s. Results from this work will be combined with other studies to help characterize the biophysical properties of the remnant bog and will ultimately allow us to better explain the environmental history of the Blaauw Eco-forest.

C: Urban Sustainability, Livability, & Sense of Place (Room 108)

[1:00-1:20pm] The Soundscapes of Streetscapes

Jonny Hamm (University of Victoria) – jonnywilliamh@gmail.com

Contemporary urban design is starting to include new and overlooked sensory aspects of the urban landscape into modern research. An important new component is design of the soundscape. Research is emerging which showcases the effects of road-traffic noise on public health, as well as the economic, environmental and social impacts. This paper presents the findings of a study in which acoustic data, gathered from 10 Victoria, BC streetscapes, demonstrating the noise abatement outcomes of a variety of urban design factors including street canyon ratios and vegetation. The results are being analyzed with a mixed-methods approach, derived from previous research on urban tranquility. Quantitative data measurements were sound pressure level (LA_{max}), equivalent sound level (LA_{eq}), and the percent of natural features (NF). Additionally, qualitative assessments are underway, assessing the more qualitative effects of urban design on driving patterns. A qualitative assessment of preliminary results showed that shorter blocks or blocks broken up by a mid-block crosswalk, while leading to more engine noise as a result of accelerating and decelerating, actually reduced the LA_{eq} due to lower traffic speeds and thereby lowering the aerodynamic and structure-borne noise. Currently, the quantitative results do not show any significant change in sound levels with the presence of vegetation.

[1:20-1:40pm] Public Sonic Geographies and Urban Livability: Changing Soundscapes in a Singapore Neighbourhood

David Sadoway (Kwantlen Polytechnic University) – david.sadoway@kpu.ca

Public perceptions of noise in urban local environments typically remains an understudied phenomenon in Asian cities, particularly in the context of rapidly changing neighbourhoods. This paper focuses on the results of a randomized residential survey ($n=304$) and quasi-ethnographic interview research ($n=34$), conducted over a two-year period (2016-17), on the fast-changing Island City-State of Singapore. Our research focuses on three distinct themes: (1) residents' perceptions and annoyances related to an array of urban sounds; (2) sound as a local quality of life and liveability issue; and (3) the public policy implications of changing soundscapes at the neighbourhood level. Singapore's sizeable public housing estates, its relatively uniform urban morphology and infrastructural designs, and its tropical-equatorial location, all provide an interesting setting for studying public perceptions about the nature of changing city soundscapes in Asia and beyond. Our study, focused on one particular high density neighbourhood in North West Singapore, provides interesting insights into the challenges of devising urban soundscape policies and plans in modern cities in a state of change. Drawing-upon our rich and diverse data, this paper's conclusions and recommendations focus on public policy implications under three broad

themes: urban noise planning and design; noise, liveability and public health; and urban soundscape-related community informatics.

[1:40-2:00pm] Towards Urban Sustainability: Community Activists Perspectives and Reflections in Cascadia

Selina Powszedny (University of Victoria) – spowszedny@yahoo.com

This paper focuses on sustainability and its future in urban Cascadia. My research identifies perspectives on the roots of what has led us to aspects of humans interactions with others and the Earth being unsustainable, what a more sustainable future may look like, and the pathways and barriers in the way to reaching this future in urban areas in Cascadia. Focusing on a specific context, in this case urban areas in Cascadia, is important as sustainability approaches cannot be universally applied, although they can offer insights and inspiration for other contexts. This research is being carried out through semi-structured interviews with sustainability activists and leaders in Victoria, Vancouver, Seattle, and Portland. With my research I look for common themes, as well as unique answers, which I hope to portray in this paper.

[2:00-2:20pm] A Tale of Three Mid-sized Cities: The Syrian Refugee Resettlement and a Progressive Sense of Place

Margaret Walton-Roberts, Luisa Veronis, Blair Cullen and Huyen Dam (Wilfrid Laurier University)
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How did communities respond to the Syrian refugee resettlement initiative (SRRI) in 2015-16 in Ontario's mid-sized cities, and what lessons can we learn from the experience? This presentation explores these questions based on a comparative research project that examined Syrian refugee resettlement in the mid-sized cities of Hamilton, Ottawa and Waterloo in the province of Ontario. First we explore how these communities mobilized resources by drawing upon historical foundations as both narrative and guide for how to respond to the resettlement demands. Second, we detail how the scope of the Syrian refugee resettlement process resulted in new players entering the resettlement space, which presented benefits and challenges to the already existing settlement sector. Third, the community more broadly became an important participant in the process of welcoming refugees, and this generosity itself had to be managed, because one of the emerging downsides of the positive community response was the perception and reality of inequity in the resources provided to Syrian versus other refugees. Finally, despite the many challenges that emerged for these communities during the intensity of the SRRI, one positive outcome is the formation of more collaborative community networks with a renewed emphasis on refugee resettlement needs.

D: Hazards & Responses (Room 124)

[1:00-1:20pm] The Use of Science and Experiential Knowledge in Wildfire Management Planning

Tara K. McGee (University of Alberta) – tmcgee@ualberta.ca

In Canada and elsewhere, social researchers have examined communities at risk of experiencing wildfire, however the agencies and practitioners responsible for wildfire management have received little attention. A research team from the University of Alberta, Deakin University, and Ministry of Agriculture and Forestry examined the use of science and experiential knowledge in wildfire management planning using a case study in Lac La Biche, Alberta where practitioners

from multiple agencies recently produced a new wildfire management plan. Findings from semi-structured interviews and a workshop confirm that scientific objects have been shaped by the values and priority of the individuals and institutions that have constructed them. This case study identified social factors that support the maintenance of institutional status quos, such as the commitment to total wildfire suppression policy, despite broad agreement about superior alternatives.

[1:20-1:40pm] Forest fires in British Columbia, smoke, and your health: How a revolution in low-cost air quality sensor technology is a gamechanger

Michael Mehta (Thompson Rivers University) – mmehta@tru.ca

British Columbia has experienced wildfire activity in 2017 and 2018 which is unprecedented. In 2017, the total cost of fire suppression for the province was \$568 million, and a review of the top 10 fire seasons in B.C. since 1950 shows that 2017 and 2018 are equivalent to the area burned during the remaining 8 worst years cumulatively. In 2018, out-of-control wildfires in B.C., driven in large part by climate change, burned 13,538 square kilometres of land, led to 6,000 people being ordered to evacuate, and created air quality advisories lasting several weeks. Concerns about how air quality was measured, and how risks were communicated during these events is significant, and the role of new, low-cost, citizen science-based approaches to air quality monitoring has increased in importance. Since 2016, I have set up dozens of Purple Air sensors across the province to understand more fully how air quality varies by elevation, proximity to a pollution source, and other factors. This network showed significant deficiencies in the provincial air quality monitoring program during wildfire events including poor spatial and temporal resolution, slow response, chronically out-of-service equipment, and the subsequent interpretations of risk based on an outdated understanding of short-term, high concentration exposures to PM_{2.5}. This paper will review the technology, demonstrate how it was used during the wildfire season, compare results to provincial monitors, and provide a better understanding of risk and the need for policy reform to provide better support for public health.

[1:40-2:00pm] Pre-consumer Plastic Pellets (Nurdles) on BC's South Coast: Keeping Our Eye(s) on Tides, Wind, and Street Drains

Daniel Brendle-Moczuk (University of Victoria) – danielbm@uvic.ca

Since 2016 pre-consumer plastic polymer pellets used in the production of plastic products have been sampled, quantified, tracked and mapped in southwest BC coasts and waterways including Vancouver's Fraser River and on the shores of the Gulf and Vancouver Islands. Plastic pellets do not readily break down and they soak up contaminants. Aquatic animals sometimes mistake the pellets as food, which may accumulate in their digestive systems causing injury and possible death due to starvation, and plastics might possibly move up the food chain. Our previous research identified the specific plastic polymer types found. Since then, utilizing field observation and data from Environment Canada, Fisheries and Oceans Canada, and Meteorological Aerodrome Reports from the US National Weather Service, patterns of the conditions necessary for nurdles to arrive on shore and areas of high nurdle concentrations were established.

[2:00-2:20pm] The Social Implications of Active Layer Change in Alaska

Chloe Chapman (University of Victoria) – chloe.chapman@outlook.com

Due to the warming climate permafrost thaw is occurring at an accelerated rate, which has numerous social and environmental implications. This study aims to look at the active layer change in Alaskan permafrost to determine if permafrost thaw is more prevalent in the interior or the coastal areas of the state. It will also examine the social implications of permafrost thaw by

determining what impact permafrost thaw is having on Alaskan communities. Studying this topic provides a better understanding of the relationships between climate change and northern communities.

E: GIS & Remote Sensing I (Room 125)

[1:00-1:20pm] Examining Jury Representation in Ottawa

Lazar Ilic (University of Ottawa) – lilic056@uottawa.ca

In recent years there have been controversies in the legal system in Canada. Certain cases have received national attention due to controversies in jury selection. This study examines jury representation in Ottawa, Ontario. Having gained access to the jury panels, for roughly a one year period which coincides with the last census year, the addresses of jurors were geocoded in order to ascertain pockets of higher and lesser representation. Using data from the 2016 census, socioeconomic characteristics have been compared to census tracts which have the most and the least amount of jurors in them. This foray into legal geography is timely as there have been few studies which investigate jury representation. Additional work remains to be done, but this presentation gives insights into the problems and challenges involved in conducting such research.

[1:20-1:40pm] A Site Selection Analysis for the Expansion of Cellular and Wi-Fi Networks for Internet Access in the Castle Region

Jeff Deurloo (University of Lethbridge) – jeff.deurloo@uleth.ca

Accessing the Internet is an ever-growing demand. To ensure the success of new tourist areas such as Castle Provincial Park in Southwestern Alberta, the management of such areas may wish to include some form of network coverage expansion. This would be in the form of Wi-Fi or cellular networks. Furthermore, it is within the interest of telecommunication companies to expand into such areas that may see an increase in tourism. The current extent of cellular coverage in Castle region is examined and it is determined that service is mostly non-existent within the park. Areas of interest to determine where best to expand coverage towards included the campgrounds with reservations, the park's visitor center and the nearby ski resort. This represents a total of 5 points of interest to see how best to expand converge towards in doing a Suitability analysis for cell towers. This is predominately based around the cell tower siting procedures given by Industry Canada and sight lines to the key points. It is determined that an ideal location for a cell tower in the region would be just outside the park, north of Castle Falls. Locations of Wi-fi networks in the region were also assessed and compared with locations in other provincial parks in Alberta. It is also concluded that the only logical location to place a wi-fi network would be at the visitor's center since no other provincial park in Alberta does otherwise.

[1:40-2:00pm] Mapping High School Catchment Areas in the Bellevue School District (Bellevue, WA, USA)

Nate Yeung (Trinity Western University) – nathan.j.yeung@gmail.com

Students residing within a school catchment are generally required to attend the local designated public school. However, often times, controversies arise when designing school catchment zones, including social or spatial inequality between catchments with students being required to attend a school further from their home. Because some roads are physically closer to a school yet are located in separate school catchment, spatial analysis can be used to determine if school catchments could be rearranged in a way where students could attend a school closer to

their home as determined by the street network. Using Geographic Information Systems (GIS), I analyzed the four high school catchment areas of the Bellevue School District, in Bellevue, Washington, USA. My results from a service area analysis indicate that current Bellevue School District high school catchments have an average of 71.8% of roads that are within a 5-minute drive to their assigned school. However, when performing service area analysis based solely on street network proximity, an ideal network-based catchment map increases that average up to 76.1% of roads that are within a 5-minute drive to their assigned school. Reducing the commuting distance between home and school decreases greenhouse gas emissions and local air pollution and can also encourage active commuting. However, the ideal Bellevue District map based on service area analysis of the street network alone may require other considerations and factors such as population and demographic data of the city.

[2:00-2:20pm] Evaluating the Scientific Reliability and Validity of a Health Impact Assessment Using Gis Methodologies and Spatial Planning Approaches

Geraldine Jordan (Trinity Western University) – geraldine.jordan@twu.ca

Motor vehicle transportation infrastructure designed to increase traffic capacity can result in substantial negative impacts on air quality and walkability of local neighbourhoods. In north Langley (BC), a highway interchange infrastructure project is currently under construction to provide access to and egress from the Trans Canada Highway along 216 Street. Of particular concern to local residents is the proximity to the project of two elementary schools. In August 2018, a draft Health Impact Assessment (HIA) of the highway interchange project was submitted to the Ministry of Transportation by a consultant. The HIA indicated that the interchange project effects will include improved local air quality; improved active commuting connectivity to transit, public pool and a local library; as well as better health equity. Community stakeholders were provided with an opportunity to review the draft HIA. As a stakeholder, I used principles of GIS connectivity and spatial planning to critically evaluate the HIA assessment approaches and project effects of air quality and walkability of the interchange project. Results of the evaluation included that the HIA lacked credible scientific sources for supporting the data of improved air quality predictions, overstatements of active commuting and public transit connectivity benefits, and lack of valid walkability data to support the HIA's claim of better health equity project effects. Because assessments of predicted project effects shapes decisions regarding major infrastructure projects, reliable data and information, as well as sound spatial methodologies are required.

F: Workshop: Storied Maps, UNSDGs and LGBTQ2+ (Room 123)

[1:00-2:20pm] Stories Maps, UN Sustainable Development Goals and LGBTQ2+

Facilitated by Ken Josephson & Crystal Tremblay (University of Victoria)

Tell me a story... a mapping game; UNSDGs in action; LGBTQ2+ Community Mapping Together, we'll explore a couple of new resources for community engagement, available through the UVic Community Mapping Collaboratory and hear of some of the impacts and emerging projects using these tools and the process of community mapping. Based on a 'conversation game', created by Dan Dougherty from the Fernwood Community Green Map, the UVic Community Mapping Collaboratory piloted a community mapping game that consists of a set of conversation prompt cards and story capture sheets. This is a freely downloadable, editable PDF that supports multiple languages. In 2016 the United Nations Sustainable Development Goals and iconography were launched at the Sustainable Cities Conference in Malmö, Sweden. In 2018, the Victoria Foundation adopted the UNSDGs in their annual report, Victoria's Vital Signs. Vital Signs is an

annual community check-up that measures the vitality of our region, identifies concerns, and supports action on issues that are critical to our quality of life. Participants will receive a set UNSDG action cards that can be used to identify local, actionable goals in your own community. In 2018, the Schools of Public Health and Social Policy and Geography at the University of Victoria (UVIC) partnered with Island Health to conduct a community mapping research project. The project aimed to map important services and places for LGBTQ2+ people on Vancouver Island in order to improve existing services. We attended Pride Festivals in Campbell River, Nanaimo, Comox, Port Alberni, Victoria and Salt Spring Island. UVIC's Geography department produced large canvas maps of the local areas and we invited festival attendees to participate in mapping activities. Participants placed stickers on the maps denoting where they access important local services. For example, participants could place stickers on the map representing sexual health services or important social spaces. Our project best fits the Community-Engaged Learning theme. We found that folx were excited to influence the services in their communities, demonstrating that community mapping is a useful exercise for community engagement. We generated a large amount of data in a short time regarding the size of our LGBTQ2+ populations in various communities, as well as their priorities. We propose a participatory workshop that recreates our community mapping activity. We would display the maps on a flat surface and provide stickers. We would present background information and explain the value of interactive community mapping as a community engagement tool and as a research method. Conference attendees would map their important services and places to obtain a participatory understanding of how community mapping creates engagement, with discussion at the end.

G: Communicating for Change (Room 130)

[1:00-1:20pm] Hunting Grizzlies in the Media: First Explorations of Media Claims and Portrayals of Public Opinion with Respect to the 2017 Grizzly Bear Hunt Ban in British Columbia

Bridget Kinsley & Zoë Meletis (University of Northern British Columbia) – bkinsley@unbc.ca

In the fall of 2017, the BC Government implemented a ban on the grizzly bear trophy hunt (August 2017), followed by a full ban on all grizzly bear hunting (December 2017). In their official announcements and commentary on the decision, government representatives cited a lack of social acceptability for the continued grizzly hunt in BC. We noted this as an unusual set of wildlife management/conservation announcements in that they named social reasons rather than “the best available science” as driving the ban. With this in mind, we sought to (re)create a timeline of grizzly-related events and stories by doing a media survey of 1990-2017. We chose this period to encompass several decades of wildlife management/conservation decision-making, and to include periods with the two main recent BC-based political parties (Liberals; New Democratic Party) in power. Our media survey includes 8 media outlets: 1 national newspaper, 1 national broadcaster, 1 regional alternative press, 4 smaller online newspapers, and 1 major municipally-based urban newspaper. In this paper, we present first results of this media analysis, contextualized within political and management histories of BC (1990-2019). We look for evidence of changes in public mindsets and claims made about the hunt's social acceptability. Incorporating theory and literature from political ecology, animal studies, natural resource management, and critical human geography, we offer preliminary understandings of key events and eras within this emerging timeline. We compare our analysis against official claims and alternative narratives of the hunt and public opinion of it in BC.

[1:20-1:40pm] Communicating Resilience for Change: Using Social Media to Ban Commercial Sale of Parrotfish in Thailand

Petch Manopawitr & Philip Dearden (University of Victoria) – pmanopawitr@gmail.com

Resilience is an important concept to improve adaptive capacity to deal with changing circumstances in the face of climate change. Herbivorous fish, especially parrotfish, are well studied for their critical role in enhancing resilience of coral reef ecosystem but public awareness and legal protection for the species are limited. Parrotfish were widely introduced for consumption by major retailers in Thailand in 2014. This study examines the effectiveness of using social media to raise public awareness on reef conservation and resilience management. The researcher conducted a continuous online communication via the social media platform, Facebook Page, on the essential role of parrotfish. The number of posts, people outreach and interaction and media coverage were monitored. Within four weeks of initiating the communication scheme, an online petition on www.change.org had been created to demand the five major retailers in Thailand to stop selling parrotfish. Over 23,000 people signed the petition and within ten days of launching, five major retailers (TESCO Lotus, the Mall Group, the Central Group, Villa Market and Makro) announced that they would no longer procure and distribute parrotfish. The online communication reached over 3 million people during the campaign and created an enabling environment for policy change among the retailers. The paper describes the campaign, suggest factors leading to its success and proposes an integrated framework on how this may be used to replicate effective communication schemes to enhance resilience for conservation.

[1:40-2:00pm] Using Youtube Videos to Fight Climate Change

Levi Hildebrand (University of Victoria) – levijacobhildebrand@gmail.com

My presentation will explore the use of video as a tool for knowledge mobilization within academia. As a student at the University of Victoria, and a professional filmmaker I have seen a missing link between the work being done in institutions and the public realm. In my presentation, I will demonstrate the ability of video to bridge that gap. My research into the use of video as a tool for knowledge mobilization in academia is relevant because of the increasing importance of video in modern communication. While traditional forms of knowledge dissemination like journals or articles are often contained to the academic communities that found them, video uses the power of storytelling to help carry knowledge to those whom it concerns most. Videos can be watched in social gatherings such as screenings or private viewings, shared widely on social media platforms, or used as educational tools in classrooms. The reason why video is so valuable as a knowledge mobilization tool is its accessibility. Video is a dynamic form of communication, allowing for viewers from different cultures, languages, or socioeconomic backgrounds to participate and engage with it. While currently under-utilized, I will explore to what extent video can be used as a tool in the mobilization of knowledge and research in post-secondary institutions, and how those institutions and individuals can support its further implementation.

[2:00-2:20pm] Contestations, Civic Entanglements and Commonly-Held Assumptions Around a Collectively-Managed Resource: A Case Study of the Olympia Artesian Well

Matt Fuller (University of Victoria) – mtfuller@uvic.ca

The early white settlers that established the town of Olympia, Washington over 150 years ago faced many environmental challenges in the brackish wetlands at the southernmost tips of the Salish Sea but access to clean, fresh water was not one of them. The valley that sheltered these early communities along the salty shores was home to a series of freshwater artesian springs that

would persist as the main source of drinking water for these communities well into the 20th century. In the early 1910's, rising prices for privately managed water led to a proliferation of well drillings into the spring in the downtown core, supplying residents with free access to fresh water. Flash forward through a 100 years of urbanization to the 21st century and this commonly-held, collectively maintained resource is now primarily accessed at one downtown well. The location has become a hotbed of controversy and civic debate over the last decade. Increasing encroachment by city planners to develop the site have seemed to be counter-balanced by increasingly frequent episodes of unlawful and unruly behavior around the recently dubbed "Artesian Commons Park." Utilizing media content analysis, this paper employs evolving geographic conceptions and political ecologies of the "commons" to illuminate the complexities of the evolving social-cultural relationships and power dynamics of everyday users and managers of the new park. Efforts to develop the park in order to bolster well-being downtown have backfired and a tone-deaf local management regime has instead manufactured civic unrest for well users and the community.

H: Workshop - Collective Biography (Room 128)

[1:00-2:20pm] Collective Biography: What Is It and Why Use It?

Facilitated by Roberta Hawkins (University of Guelph) – rhawkins@uoguelph.ca, Pamela Moss (University of Victoria) – pamelam@uvic.ca, Karen Falconer Al-Hindi (University of Nebraska at Omaha) and Leslie Kern (Mount Allison University)

An interactive workshop on the collective biography method. Collective biography uses researchers' written memories about a set of experiences as texts for collective analysis. As a feminist approach to research, collective biography draws centrally on the idea that significant memories are critical in the constitution of the self, and maintains that in analyzing memories collectively, researchers can begin to tap into wider social processes and structures. Though rarely used in geography, collective biography could be useful in data collection and analysis for geographers. Together the workshop organizers have used collective biography since 2013 to examine the work that joy does in our academic lives as feminist geographers. We are driven to examine joy because its arrival, and its importance, is often overshadowed by the oppressive aspects of academic life (be they neoliberal, sexist, racist, colonial, ableist...). We contend that moments of joy - however brief - can be found and fostered within these structures, and that these moments also shape us as feminist academic subjects. We will thus encourage workshop participants to focus on these joyful moments by guiding them through a mini collective biography exercise. By collectively sharing our practices for cultivating joy our intention will be to make space through the workshop structure for hope, potential and collaboration as well as to highlight the possibilities that the collective biography method might hold for geographers.

Break & Poster Sessions 2:20pm – 3:00pm

Poster Sessions (Lobby)

[2:30-3:00 pm] Poster Session (*see below for poster listings*)

Afternoon Sessions II 3:00pm-4:30pm

A: Geographic Education - The Student Experience (Room 116)

Chair: CindyAnn Rose-Redwood (University of Victoria)

[3:00-3:20pm] Perceptions of Safety and Campus Design: Student Experiences at the University of Alberta

Eden McDonald-Yale (University of Alberta) – eden3@ualberta.ca

The unique traits and experiences each person has are not always considered in the planning process. For example, fear is a subjective experience; different people will experience varying levels and types of fear in any given space. While gender is the most consistent factor in explaining who experiences fear, fear of crime also varies according to the environment. Understanding fear is important because it not only impacts a person's sense of safety but also their quality of life. Further, university students who fear for their safety on campus, regardless of whether they become a victim, may experience a very different learning environment than students who do not experience fear. In this ongoing research project, I will survey students at the University of Alberta to explore their perceptions of safety on campus. This analysis involves both qualitative and quantitative methods. An initial literature review revealed key themes regarding the socio-spatial factors that influence fear. Surveys of the student population will identify areas of campus where students feel safe and unsafe and highlight why these areas impact students' perceptions. The project will conclude with recommendations for improved campus design based on student perceptions and best practices identified in the literature review. This research will contribute to the broader literature regarding perceptions of safety on university campuses and has the potential to inform University plans and policies regarding the campus built environment.

[3:20-3:40pm] Beyond Borders and Bank Accounts: Perceptions of International Student Tuition Increases at the University of Victoria

Duncan Jones, CindyAnn Rose-Redwood & Reuben Rose-Redwood (University of Victoria)
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International students contribute vital diversity to academic environments. The presence of international students at Canadian higher education institutions has immeasurable benefits to the diversity of thought upon which all academic progress is founded, and the connections domestic students make with the global community are vital to their future success in the global economy. However, in recent years, international students have been targeted by dramatic tuition increases at higher education institutions, a trend that has made the pursuit of international education restrictive or impossible to many. This honours thesis examines the rationale for, and the perceptions of, international student tuition increases at the University of Victoria in British Columbia, Canada. In particular, it compares the University's tuition increases to international student tuition data and related information from competitor universities while also conducting a thematic analysis of interview data provided by a sample of international students at the University. The results of this study have demonstrated that though increasing tuition rates are seemingly universal, the effects they have on the international student population are still substantial and require action from the University of Victoria as well as any institutions implementing similar increases.

[3:40-4:00pm] Student Satisfaction with an International, Human Geography Field Course in Japan

Tom Waldichuk (Thompson Rivers University) – Twaldichuk@tru.ca

Some geography field courses are instructor-led, point and see tours, which can be advantageous in places with different languages and customs. Over the years, my undergraduate field course in Japan has become more student-centred and project-focused. The skills my course emphasizes are making observations and taking notes. Do the students like independent projects? What do they think about the note-taking requirements? To how many places do they want to travel? What are the concerns of students who are not geography majors? The main objective of this presentation is to describe student satisfaction with this course's field experience. A questionnaire was distributed to students in Japan at the end of the field trip in 2014 and 2017. The responses are supplemented by follow-up email surveys, online surveys from previous years, student field notes, and anecdotal information. The results indicate that two thirds of the students in 2017 wanted to travel to more places, unlike the group in 2014. The majority of the students in 2014 and 2017 liked the student-led walkability project. However, fewer students in 2017 listed field note taking as a skill that they learned. In addition, students wanted more time to write field notes, and some did not know when to take them and how many to take. The principal conclusion is that students were satisfied with the course's field component; however, they need more guidance when taking notes. As a recommendation, geography majors can mentor the other students while enrolled in the course.

[4:00-4:20pm] Young Olympians: Examining Geographic Education and Students' Experiences in the 15th International Geography Olympiad

Yu Richmond Ho Shing (Thompson Rivers University) – richmond1992@hotmail.com

The International Geography Olympiad (iGeo) is an international competition that is held annually in different corners of the world for seven days. The competition invites four national geography champions (age 16 to 19) from each participating country to compete in four challenging events: a written exam, field analysis and a Multimedia exam. I volunteered at the 15th annual iGeo held at Laval University, Quebec City from July 31st to August 6th, 2018. The successful completion of iGeo 2018 was significant in that, Laval University was the first French university in North America to host the event. Moreover, this competition showcased young talented Canadian geographers to the world. As a student volunteer who participated in the event, I witnessed different geographic education philosophies, a variety of student experiences, and huge discrepancies and inequalities among students from all participating countries. This presentation focuses on my personal experiences at the competition to address the following topics: (a) the daily activities of iGeo volunteers, (b) students' experiences with iGeo, and (c) geographic education around the world. In conclusion, educators from different countries view geographic education differently. For example, some educators focused on human rather than physical geography. On the other hand, most student participants enjoyed a mixture of fun and stress throughout the week. However, students who I encountered had a mix of emotions towards the discipline and the competition.

B: Climate change impacts and resilience planning: Insights from Western Canadian communities (Room 104)

Chair: Jeff Birchall & Derek MacDonald (University of Alberta)
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[3:00-3:20pm] Community Scale Climate Vulnerability: The Case of Surrey, British Columbia
Nicole Bonnett (University of Alberta)

Climate change is one of the most important and complex challenges facing society today. As greenhouse gas emissions continue to increase unabated, with models forecasting further increases in temperature, and greater climate variability in general, the need for adaptation to reduce the risks of dangerous climate change is becoming more immediate. While adaptation is particularly important at the local level, strategic planning remains limited. Likewise, scholarship that critically explores specific stressors and decision dynamics around policy and action is under-represented. This qualitative study seeks to narrow the gap. Through interviews with a range of local government officials, this study explores governance around adaptation policy conception and development, as well as action implementation. Analysis of strategic planning documents was included in the study.

[3:20-3:40pm] Climate Risks and Decision-Maker Response in North Vancouver, British Columbia

Cellina Heang (University of Alberta)

Climate models forecast further increases in temperature, more extreme weather events and a rise in sea-level, which will result in greater risk to coastal communities. Yet planning for climate change adaptation is under represented in local government, as is empirical (key actor) research that critically investigates the decision dynamics around why and how communities incorporate planning for climate adaptation into policy and practice. The presentation will highlight findings from research into the motivational factors (e.g. slow v. immediate threats), extent (e.g. embedded v. appendage actions) and nature (e.g. reactionary v. anticipatory) of adaptation planning in North Vancouver, British Columbia, a coastal community that has demonstrated commitment to increasing it's resilience to climate variability. By exploring the decision dynamics around community adaptation plan/ policy conception and action implementation, this research sheds light on the role planners play, and the expertise planners harness in order to help their community become resilient to climate change.

[3:40-4:00pm] Climate Change Impacts and Local Government Actions: The Case of Victoria, British Columbia

Vada Antonakis (University of Alberta)

Climate models forecast further increases in temperature, more extreme weather events and a rise in sea-level, which will result in greater risk to coastal communities. Yet planning for climate change adaptation is under represented in local government, as is empirical (key actor) research that critically investigates the decision dynamics around why and how communities incorporate planning for climate adaptation into policy and practice. The presentation will highlight findings from research into the motivational factors (e.g. slow v. immediate threats), extent (e.g. embedded v. appendage actions) and nature (e.g. reactionary v. anticipatory) of adaptation planning in Victoria, British Columbia, a coastal community that has demonstrated commitment to increasing it's resilience to climate variability. By exploring the decision dynamics around community adaptation plan/ policy conception and action implementation, this research sheds light on the role planners play, and the expertise planners harness in order to help their community become resilient to climate change.

[4:00-4:20pm] Local Government Resolve for Climate Change Adaptation: How Climate Vulnerability Links with Strategic Policy in British Columbia

Derek Macdonald (University of Alberta)

Climate models forecast further increases in temperature, more extreme weather events and a rise in sea-level, which will result in greater risk to coastal communities. Yet planning for climate

change adaptation is under represented in local government, as is empirical (key actor) research that critically investigates the decision dynamics around why and how communities incorporate planning for climate adaptation into policy and practice. The presentation will highlight findings from research into the motivational factors (e.g. slow v. immediate threats), extent (e.g. embedded v. appendage actions) and nature (e.g. reactionary v. anticipatory) of adaptation planning in Victoria, British Columbia, a coastal community that has demonstrated commitment to increasing it's resilience to climate variability. By exploring the decision dynamics around community adaptation plan/ policy conception and action implementation, this research sheds light on the role planners play, and the expertise planners harness in order to help their community become resilient to climate change.

C: Workshop - Towards a Place-Making Matrix for Urban Development (Room 108)

[3:00-4:20pm] Towards a Place-Making Matrix for Urban Development

Facilitated by Don Alexander & Lindsay McCunn (Vancouver Island University)

Don.Alexander@viu.ca

During most of the modern period (1920s to '80s), many people in the design professions have shaped North American urban environments according to narrow criteria of aiding and abetting the automobile and enhancing profitability in retail and residential development. Geographers, such as Yi Fu Tuan and Edward Relph, were among those who were critical of these trends towards creeping placelessness. In the last forty years, they have helped engender a movement to evolve genuine urban places that meet the needs of diverse populations, the needs of other species, that impose a lighter ecological footprint, and that serve as centers of tolerance, creativity, and innovation. This presentation will offer a matrix for evaluating and guiding the construction of urban communities that involves these attributes. Evaluative categories include ecology, functionality (for diverse groups), aesthetics, civic engagement, social justice, and psychosocial well-being. Because time is not adequate to workshop the entire matrix, we will focus on engaging participants in an exercise in mental geography wherein they will analyze for themselves the three dimensions of Jorgensen and Stedman's (2006; 2001) model of sense of place: place attachment, place identity, and place dependence. They will discuss their appraisals in small groups, seeking commonalities, and then share their findings with the larger group.

D: Islands (Room 124)

[3:00-3:20pm] Resilience and Sustainability in a Hub and Spoke Economy: Inter-Island Dependencies in Hawaii

Patrick Buckley (Western Washington University) & Jason Levey (Hawaii University)

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The State of Hawaii produces benchmark Inter-Regional Input Output (IRIO) tables on a periodic basis. Given the geographic isolation of these islands, this provides a unique opportunity for applying multiregional analysis focusing on issues of resilience and sustainability. Information on an industry's linkages with the rest of the economy across interconnected regions helps us to better understand the structure of an economy and how it changes over time and space, which in turn is important in formulating economic policies. Linkage dependency analysis also sheds light on the success of policies designed to strengthen linkages between various sectors and regions in

an economy to foster resilience, specifically in Hawaii's production structure. To analyze these interdependencies, we use the linkage approach of Dietzenbacher and van der Linden (1997), a variant of the Hypothetical Extraction Method (HEM) which allows for a clear separation into backward and forward linkages. We then show that linkage analysis of Hawaii demonstrates what we define as a hub and spoke dependency between the primate island of Oahu and its three peripheral islands of Maui, Kauai, and Hawaii, where these are dependent on flows that originate in Oahu. As a consequence attempts by the state to increase resilience and sustainability in an era of climate change face unique challenges which may require rethinking of current trade and transportation patterns as much as increasing local production of food and energy. This paper serves as an initial investigation into and inventory of the level of changes that may be needed to foster such change.

[3:20-3:40pm] Tidepool Teachings: An Ethnography of Savary Island

Marina Aitcheson (University of Victoria) – marina.aitcheson@gmail.com

This summer I was fortunate enough to spend at my Grandma's cabin on Savary Island. When describing Savary to friends, I often think of the white sandy beaches, fresh seafood and familiar faces. This summer I began to question more about Savary: Is the cabin sustainable just because its off grid? Why is it important to have community events on Savary? What infrastructure is available to meet the demands of tourists? This presentation will outline my personal lens of Savary Island complimented by literature on sustainability and intergenerational spaces. At the very least, this presentation will show the importance of our own tide pool teachings within the Geography discipline.

[3:40-4:00pm] The Role of Ecotourism in Changing Conservation Attitudes

Jackie Ziegler & Philip Dearden (University of Victoria) – jackie.ziegler@gmail.com

A basic tenet of ecotourism is to enhance conservation. However, few studies have assessed its effectiveness in meeting conservation goals and whether the type of tourism activity affects these outcomes. The purpose of the present study was to determine if working in ecotourism changed locals' attitudes and behaviours towards the focal species and its habitat, and, if so, if the type of tourism present affected those outcomes. We interviewed N=114 respondents at four whale shark tourism sites in the Philippines (mass, mid-tier, small-scale, failed) to compare changes in perceptions of, and behaviours towards, whale sharks and the greater marine environment. We found that the smaller scale tourism sites had greater conservation outcomes than the mass or failed tourism sites, including changes in perceptions of whale sharks, conservation ethic, and changes in behaviours towards whale sharks and the ocean. Furthermore, of the three active tourism sites, the smallest site with the lowest economic returns and the highest negative impacts on whale sharks prior to tourism activities had the largest proportion of respondents who reported a positive change in perceptions and behaviours towards whale sharks and the ocean. Our results suggest that tourism type, and the associated incentives, can have a significant effect on the conservation outcomes of the activity and therefore the conservation of an endangered species.

[4:00-4:20pm] Sustainable Island Tourism Through a Tourist Lens

Shelly Selivanov, Philip Dearden, & Rick Rollins (University of Victoria)
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Tourism is a critical and growing part of the are part of the same archipelago but have differing natural attributes, levels of tourism development, markets, and levels of current and potential future sustainability. However, there are signs that all are evolving to maximize tourist numbers due to a lack of adequate planning and controls . The study objectives were to identify

tourist preferences , assess differences across the archipelago and identify optimal future scenarios for sustainable tourism as defined by visitors. Unlike current trajectories, visitors to each island vary considerably in motivations, preferences for activities and settings, experiences, and attitudes toward conditions and management suggesting the need for a more place-based approach to tourism planning with greater attention to future sustainability. This diversity suggests that experiences may be enhanced through management strategies, such as zoning, that provide opportunities for serving different market niches which can be described using concepts such as specialization and market segmentation to enhance future sustainability.

E: GIS & Remote Sensing II (Room 125)

[3:00-3:20pm] Pre-disaster Mapping with Drones: An Urban Case Study in Victoria, Bc, Canada
Maja Kucharczyk (University of Calgary) – maja.kucharczyk@ucalgary.ca

We report a case study using drone-based imagery to develop a pre-disaster 3D map of downtown Victoria, British Columbia. This exercise was undertaken for City of Victoria's Emergency Management Division and in partnership with GlobalMedic, a Canadian disaster-relief charity. This represents the first drone-based pre-disaster mapping mission over an urban area approved by Canada's aviation authority. The goal was to assess the quality of the pre-disaster 3D data in the context of geospatial accuracy and building representation. For safety reasons, we were legally constrained to using a lightweight (1 kg) senseFly eBee Plus fixed-wing drone with a down-looking camera, which presents challenges for capturing images of building facades. The images, acquired over downtown Victoria, were georeferenced with the drone's built-in real-time kinematic (RTK)/post-processed kinematic (PPK) functionality. Image processing using Pix4Dmapper yielded a digital surface model (DSM) and photorealistic 3D model. The vertical accuracy of the DSM was quantified using 339 light detection and ranging checkpoints located on flat rooftops. Building representation in the 3D model was evaluated using Google Earth 3D as a reference. Results indicate that the geospatial accuracies would allow for sub-meter building collapse detection, suggesting that RTK/PPK-enabled drones are required for this application. Regarding 3D building representation, large data gaps on building facades corresponded with severely distorted geometry and texture in the 3D model. Therefore, we suggest a follow-up study with a senseFly eBee X and SODA 3D camera that tilts for capturing facades. This research is currently under review by Natural Hazards and Earth System Sciences.

[3:20-3:40pm] Unmanned Aerial Vehicles and Structure-from-Motion (SfM) for Change Detection in Alpine Environments

Thomas Porter (University of Lethbridge) – portta@uleth.ca

In Alberta today, there is increasing pressure on headwaters ecosystems (Gov't of Alberta, Water for Life, 2010). Growing populations mean a growing demand for water resources, which are provided by alpine ecosystems along the front range of the Rockies. Human impacts on the landscape, along with climate change, threaten to alter the ability of headwaters to meet the water needs of those downstream. The intent of this NSERC-funded (USRA) independent study was to research and develop techniques for using small, commercially-available Unmanned Aerial Vehicles (UAVs) for multi-temporal change detection in alpine environments. Using UAVs for plot-scale research represents a significant opportunity to gather information about landscapes at a resolution that is difficult to obtain with the current suite of acquisition tools (i.e. manned aerial photography, LIDAR, satellite) (Lucier, de Jong, Tuner, 2013; Obanawa, Hayakawa, 2018). Traditional methods for aerial multi-temporal imaging (satellite, LiDAR, aerial photography) are

subject to a variety of limitations. These constraints include things like repeat times, accessibility and costs (Shahbazi, Sohn, Theau, Menard, 2015). The desired outcome of this study was to become familiar with current consumer-grade UAV technology, flight-planning software, UAV legislation and digital analytical tools. The study would examine the pros and cons of using such technology for geographical research through a process of literature review, public engagement, field trails and subsequent data analysis. This exploration will help determine if this type of equipment and methodology is worth pursuing going forward and under what conditions the technology could be applicable in a research context.

[3:40-4:00pm] Sea Ice Type Detectability Utilizing Simulated Radar Data During Advanced Melting Conditions

Aikaterini Tavri (University of Victoria) – atavri@uvic.ca

Arctic sea ice extent and thickness present unprecedented minima in recent years. Sea ice thermodynamic evolution is linked to global feedback mechanisms, as well as to several human activities and biological processes. Thus, monitoring sea ice spatiotemporal variability is critical for understanding the development of these mechanisms. Due to the remoteness of the Arctic environment, Synthetic Aperture Radar (SAR) data has been traditionally employed to study sea ice dynamics and operational sea ice monitoring. Advanced Synthetic Aperture Radar data is related to polarimetric information analysis. When exploiting polarimetric data, relations between the scattering mechanisms and sea ice surface are retrieved by altering the microwave signal orientation. In the present study, the potential of compact polarimetric data use for sea ice classification is examined. Based on simulated RADARSAT-2 scenes, polarimetric descriptors are calculated for quantitative analysis. Key locations in the Canadian Archipelago are examined throughout sea ice evolution, focusing on advanced melt. Backscatter signature analysis for 32 compact polarimetric features is performed to determine statistical relations and sea ice type separability. In addition, comparison between data acquired with steep and shallow incidence angles is presented for feature performance analysis. The aim of this work is to provide a complete set of indispensable compact polarimetric parameters for sea ice type classification over seasonal cycles, considering the influence of incidence angle. The examined dataset is simulated to the acquisition modes of the upcoming Radarsat Constellation Mission (RCM), to predict the utility of the compact polarimetric data for sea ice studies.

F: Workshop - Confronting toxic masculinity (Room 123)

[3:00-4:20pm] Confronting Toxic Masculinity in Geography: A Workshop of Discussions Aimed at Amplifying Our Efforts for Safer Workspaces and Professional Relationships

Facilitated by Matt Fuller, Paige Bennett & Tyler Blackman (University of Victoria)
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Turning inward and reflecting on our disciplines own culture, climate and professional practices is difficult but vital work. In this workshop we ask what is toxic masculinity and what does it mean for geographers in our region? How is sexism and the structure of masculinity embedded in our situated geographic and academic contexts? In this workshop, we want to discuss and foreground both experiences, strategies, and practices in understanding and meeting the lived gendered power imbalances in our home departments and professional relationships. Moreover, we also aim to prioritize how colonial racism complicates the ways in which issues of gendered power imbalances are experienced and perpetuated in our discipline and our region. Toxic masculinity is found across our field and in sub-disciplinary identities. Disproportionate levels of

risk, harm and privilege are experienced across the populations of students, faculty, staff and research communities. By moving through these experiences as much as we can we aim to start building a platform — to construct a regional language of action, practical materials, and methods for challenging toxic masculinity and navigating ongoing power relations in which they are (re)produced.

G: The Subjects of Environmental Governance (Room 130)

[3:00-3:20pm] Material Dependencies as Assets or Constraints for Sustainable Development

Kristof Van Assche, Monica Gruezmacher (University of Alberta), & Leith Deacon (University of Guelph) gruezmac@ualberta.ca – vanassch@ualberta.ca – leith.deacon@uoguelph.ca

We deploy and develop the concept of material dependencies to assess paths towards sustainable community development. We take governance as the crucial entry point in understanding human environment relations. Through the understanding of governance evolution it is possible to disentangle crucial interactions in social- ecological systems. Material dependencies are influences of the material environment on the governance path, motivating or constraining the way a community develops. The material world, both natural and man-made can be either an asset or obstacle in setting governance in a given direction. The physical nature of a resource can create unique material dependencies, directly and indirectly, by creating infrastructures which then form new dependencies. The physical landscape and climate trigger their own material dependencies. Natural landscapes can initially shape a governance path which in turn can later be shaped by cultural landscapes. Attempts to overcome one material dependency (cold climate) can create new ones (infrastructure dependence). This entangling of material and other dependencies affects how communities develop and how they can be routed on more sustainable paths. We analyze three communities in the northern peninsula of Newfoundland: Corner Brook, Saint Anthony and Norris Point, each tightly linked to their physical landscape, resources and infrastructures. Through this analysis we draw conclusions on the possibilities for community reinvention and sketch a possible framework of questions guiding community self-reflection. Instigating reflexivity regarding the web of material dependencies paves way for new forms of asset mapping within community development and planning - distinct from focusing on a particular resource or concept as guiding principle.

[3:20-3:40pm] The Unique Strengths of Faith Communities for Environmental Governance in Canada

Claire Brandenbarg & Joanne Moyer (King's University College) – claire.brandenbarg@lab.kingsu.ca

As the trend in Canadian environmental governance shifts from state-led management and legislation to the inclusion of more non-state bodies, new actors are being provided the opportunity to become more involved in environmental management processes. While these opportunities have often been seized by environmental non-governmental organizations (ENGOS), this paper proposes that faith communities offer unique strengths and capacities as potentially effective actors in Canadian environmental governance. Such strengths include the ability to establish and apply ethical frameworks, shape worldviews, and inspire and encourage action. These findings were the result of a qualitative research study comprised of 18 different faith communities in Canada. In interviews, participants were asked about their faith community's approach, history, theological basis, range of activities, barriers, strengths, and role in regards to environmental engagement in Canada. Data was then analyzed for patterns in NVivo, reaching the conclusion that many faith communities in Canada have become increasingly dedicated to

environmental governance and sustainability, both internally and externally. As such, recognizing and understanding the unique capacities and strengths of faith communities for environmental governance may help yield innovative and effective approaches for addressing environmental issues in Canada.

[3:40-4:00pm] Gender Transition and Changing Interactions with the Environment

Sam Wall & Zoe Meletis (University of Northern British Columbia) – mwall@unbc.ca

Transgender people have been studied in a variety of different academic disciplines, revealing the unique ways transgender people interact with their environment and vice-versa. Available studies have grown significantly in recent years (Lubitow et al., 2017; Johnston, 2016, 2018; Stone, 2018), and this report will seek to develop an interdisciplinary understanding of the current literature regarding transgender people. The social environment for transgender people in North America is influenced by decades of activism in the United States (Stryker, 2017), and cultural gender variance from an ethnically diverse population who bring nonbinary genders to the forefront (McNabb, 2018). Research and practice in the health sector have influenced treatment of transgender people, but the immense medical focus ultimately limits trans existence to medical experience (Rubin, 2003). Despite similar subject matter, feminist and queer studies often favor gender and sexuality binaries which exclude transgender people, resulting in the relatively independent discipline of transgender studies, which often uses personal experience to explore and question gendered narratives (Nash, 2010). At the same time, intersectional feminist and queer approaches can highlight institutional discrimination and gendered absences (Johnston, 2018). Guided by personal narratives from transgender people (Spoon & Coyote, 2014; Doan, 2017; Stewart, 2017), I will explore my experience in the context of Northern British Columbia, and discuss the common themes of trans experiences of home, online places, and travel.

Workshop - Field Journaling (Room 128)

[3:00-4:20pm] Field Journaling Techniques and Perception/Meditation/Landscape

Facilitated by Maleea Acker (University of Victoria) – maleeaacker@gmail.com

In this engaging workshop, I will introduce participants to field journaling techniques (as practiced by Lyn Baldwin, Thomson Rivers University, BC), memory mapping (from Marlene Creates, visual artist, Newfoundland), and writing and metaphor exercises (such as I have taught as a creative writing instructor in past years). Field journaling and associated techniques can help enhance perception, meditative practice and emotional response to landscape. You do not need to be an artist to participate. You will recognize the benefits of learning to see from a perspective other than the rationalist, Cartesian, dualism often foregrounded in the social sciences. The use of visual art practices and the use of metaphor in order to holistically understand our relationships with the world strike me as extremely important when designing and teaching not just the GeoHumanities, but all of Human and Physical Geography. Exposure to these practices, as well as to the study of humanities and fine arts techniques, results in a different classroom format (increased field study, but not for the purpose of categorization) and different learning outcomes (an emphasis on practice, theory and emotion, rather than on memorization or technical skill).

WDCAG Annual Meeting 4:30pm – 5:30pm (Room 108)

Poster Sessions

9:30-10:00 am; 12:30-1:00pm; 2:30-3:00 pm (Lobby)

***Posters will be available throughout the day in the main lobby. Poster authors will be available to showcase their work and answer questions at the noted times.**

#	Name, Institution	Title
1	<p>Social Impacts of Oil Extraction in Niger Delta, Nigeria Achunike, Obumneme & Catherine Nolin (University of Northern British Columbia) achunike@unbc.ca; nolin@unbc.ca</p> <p>Oil was discovered in Nigeria in 1956 at Oloibiri in the Niger Delta Region after almost 50 years of exploration. Shell-BP was the sole concessionaire until after Nigerian Independence in 1960 when exploration rights were extended to other multinational oil companies. For decades, more than 16 multinational oil companies operated in the Niger Delta Region with little or no supervision from the Nigerian Government which created significant environmental, political and social impacts in the region. This research focuses on the social impacts of oil extraction on the Indigenous people of the Niger Delta Region and identifies how the environmental and political climate affects their daily lives due to negligence of the Nigerian Government and the multinational oil companies. Preliminary analysis of a scoping review of related literature revealed five categories of social impacts for further study: cultural, community, economy, family and youths. Preliminary assessment supports the theory of 'resource curse' in the Niger Delta Region from a social, environmental and political perspective.</p>	
2	<p>Sediment budget changes in a large Himalayan drainage basin in the 21st century Ali, Faran (University of Northern British Columbia) faran.ali@unbc.ca</p> <p>High mountain regions like the Himalayas are characterized by a high rate of denudation, with river systems like the Indus acting as the export mechanisms for sediments. Over the last two decades, the upper Indus River basin has experienced significant changes resulting from natural processes and human activities which have considerably affected its sediment dynamics. Sediment budgeting is a powerful conceptual framework for examining the relationships between sediment sources, sinks, fluvial transport and sediment yields, and investigating how these relationships are affected by changes in land use, climate change, seismicity and isostatic adjustment. The main goal of this research project is to evaluate the sediment budget changes in the upper Indus River basin from the 20th to the 21st century and its implications in terms of their likely individual and cumulative impacts on the river system. Two suspended sediment budgets were constructed for the basin for the periods 1963-1998 and 2001-2014 by utilizing the available hydroclimatological data. A comparison of the spatial distribution of preliminary sediment yields derived from these sediment budgets for the two periods reflects the complex relationship between the suspended sediment dynamics, and the natural and anthropogenic factors controlling the sediment yields in the basin.</p>	
3		

	<p>A day in the life of your lungs: Geospatially-based real-time air quality monitoring of PM2.5 Baker, Brittni; Cramer, Scott; Keast, Marina; Makar, Brandon; Rottler, Katherine; Selena Schut & Zhe Li (Thompson Rivers University) mmehta@tru.ca</p> <p>Air quality monitoring of particulate matter at the PM2.5 scale is being revolutionized by advances in low-cost sensor technology. Since 2016, a network of these sensors has been setup in British Columbia based on the Purple Air platform. There are now more than 50 of these sensors spread across the province. These devices provide real-time readings of PM2.5 levels, taken at 20 second intervals and averaged across two laser particle counters, with data sent to a Cloud server and displayed on a network map. Several peer-reviewed studies have shown this platform to be reliable, possess good accuracy, and that they are an excellent indicator of general trends in air quality. The U.S. Environmental Protection Agency is using the technology for community-level monitoring in the South Coast Air Quality Monitoring District [in California], and they have set up a performance evaluation center which rated Purple Air as one of the best overall performers in the class. These devices, and regulatory instrument counterparts, are designed primarily for stationary use. Our team has developed a methodology for using Purple Air sensors combined with a GPS to generate rich 3D maps using ArcGIS that better reflects individual exposures to PM2.5 across a 24-hour period. This information yields new insights into how risks from air pollution can be reconceptualized.</p>
4	<p>The Effects of Urbanization on the Biogeography of Grizzly Bears in Western Canada Barone, Katryna (Thompson Rivers University) katbarone96@gmail.com</p> <p>Biogeography is the study of the distribution of a species in geographical space, across geological time. This study mainly focuses on how environmental factors and human influences affect the distribution of a specific species, which will be presented in a poster format. Of all human induced changes, urbanization is one of the main processes shifting biogeographical patterns. In Canada, the effects of urbanization can be seen best when studying the threats posed to some of the country's largest and most symbolic animals: grizzly bears. Grizzly bear populations are a special concern in terms of conservation efforts in Canada. The species have slow reproductive and population dispersal rates, and their survival relies on their ability to consume enough food to be stored for hibernation. This is the main reason grizzly bears are attracted to urban areas, where there is an abundance of calorie rich foods. This however, leads to habituation, food conditioning, and higher rates of human induced mortalities for grizzly bears. It also increases the amount of human-wildlife conflicts, often resulting negative consequences for both people and bears. Findings saw that urban areas present other challenges to bear populations through habitat degradation, habitat fragmentation, and population isolation. They are also big drivers of pollution and climate change. Present conservation efforts and management plans are found to be ineffective. However, by implementing more proactive plans and education and bear safe programs this study concluded that the negative effects of urbanization threatening grizzly bears and their habitats in Western Canada can be mitigated.</p>
5	<p>Biophilic City Design and Land Use Planning Bracken, Edward (Vancouver Island University) ejbracken@shaw.ca</p>

	<p>Biophilic city design assists planners who are sensitive to nature-human connections to incorporate the realities of climate change and to ensure the affordability of biophilic designed homes. These designs are aesthetically pleasing, health promoting and able to solve problems such as seasonal flooding in a practical way. Design and architectural firms using biophilic designs, combined with social science research, strive to improve clients' health and wellbeing inside and outside of the built environment. Spaces that are built with a biophilic design are places that children enjoy because of their connection to nature as demonstrated in their design related artwork. Biophilic design reconnects us to nature in a way that brings our interactions with buildings and other infrastructure to life in a manner that can be replicated in other countries or situations. Biophilia, a love of nature, is viewed as "the missing link in sustainable design" according to Yale University's Stephen Kellert (Wilson, 2006). When people are directly involved in design, they innately tend toward creating spaces that feature biophilic elements such as large windows built with the view of a natural setting. If we build sustainable and affordable homes that are also biophilic for children and the elderly, we will build a better future for everyone because if vulnerable populations are well-served, then the rest of the population will be as well. With sustainable planning, planning for climate change, strong designs and enforceable legislation, we can make a difference in the social fabric of cities by putting the environment and children first.</p>
6	<p>Sustainable Practice and Challenges of Global Indigenous Communities Buzath, Jane; Alfred Sales & Dominic Wong (University of Victoria) dominic.wong.ca@gmail.com</p> <p>The rights of indigenous groups to their ancestral land is being trampled with various means of suppressions by corporations and the government that are still occurring up to this present day. The lands which indigenous groups have inherited were taken and subdivided and many sustainable environmental practices were lost while the environment is being abused. This research explores sustainable practices and environmental challenges of three distinct indigenous communities: Coast Salish people (Canada), the Sámi (Northern Scandinavia and Russia), and Maasai (Kenya and Tanzania) people. Though these communities are geographically separated and may have different sustainable traditions, but they all are facing the effects of cultural genocide, climate change, and other complications. Under the influence of western education, it caused many indigenous groups losing the fluency to speak their mother tongue and preserve their cultural heritage; due to many indigenous groups heavily depend on their language to pass on their history. Losing the lands and cultural practices can be detrimental to their mental health, as it contributes higher depression & anxiety rates in indigenous communities. As 2019 designated as the International Year of Indigenous Languages by the United Nations, this poster aims to raise awareness of the surrounding sustainability issues in indigenous groups worldwide while being forced off their lands and limited their traditional sustainable practices. Being able to share these findings may widen the public's view to the ways indigenous communities are cultivating and harmonizing their lands, and thus allowing them to nurture a more sustainable lifestyle in modern society.</p>
7	<p>A Dendroclimatological Reconstruction of Climate in the San Juan Ridge Area on Vancouver Island, B.C. Cliche, Élise (University of Victoria)</p>

	<p>Dendroclimatological and dendrohydrological reconstructions use the information contained in tree-rings to produce annually resolved hydroclimatic records that provide insight into long-term natural climate variability. On San Juan Ridge, Vancouver Island, B.C., the climate sensitivity of mountain hemlocks (<i>Tsuga mertensiana</i> (Bong.) Carrière) offers the opportunity to develop records of environmental change spanning centuries. This research focuses on developing proxy records from a remote high elevation site on southern Vancouver Island. The research objectives are to: 1) construct representative tree-ring chronologies from samples collected on San Juan Ridge; 2) employ dendroclimatological methodologies to reconstruct a summer (June-July) air temperature record spanning the duration of the chronologies; and, 3) document any interannual and multidecadal relationships between these proxy records and large-scale climate patterns in Pacific North America. The results will hopefully add to information regarding regional climatic variations in B.C., and will assist with developing a better understanding of the climatic history and variations throughout the province. Additionally, the tree-ring chronology as part of this research will update and enhance an existing San Juan Ridge chronology collected in the late 1990s by researchers from the University of Victoria Tree-Ring Laboratory (UVTRL). Transfer functions are to be used to reconstruct records of the climate variable with the strongest relationship to each chronology, and linear regression models will be employed to predict past values. It is expected that these proxy records will provide the first detailed insights into hydroclimatic changes at high elevation on southern Vancouver Island that predates the instrumental history.</p>
8	<p>Breaking Barriers: Illegal OHV use and vandalism within Castle Provincial Park, Alberta Colosimo, Adam & Ben Charlebois-Perry (University of Lethbridge) adam.colosimo@uleth.ca</p> <p>People are, in part, products of their culture. When change is forced on people they sometimes tend to rebel. This rebellion is evident in the changes to the use of Off Highway Vehicles (OHV) in Castle Provincial Park (CPP) beginning in the summer of 2017. The land once open for public use by OHVs was closed and forced these vehicles and their users to go elsewhere. In response to this, some OHV users are still illegally using barricaded trails within the new park. To access these trails, riders are tearing out, and breaking down the barriers erected by Alberta Parks. This study uses a combination of literary research, field work, and GIS to better understand the spatial distribution of the territorial behavior exhibited in areas of CPP. It was found that the territorial behavior was fostered by the groups long term presence within the castle region. As well, the spatial distribution of these crimes was found to be clustered, primarily occurring around random camping areas. Because of this, crime was found to be predictable, as all the sites found were normally distributed about mean center. This paper explores the political, sociological and scientific factors surrounding the decision and its aftermath of the OHV community within Castle Provincial Park.</p>
9	<p>Exploring the dendrochronological landscape of the Blaauw Eco-forest, Langley, BC Cook, Natalie; David Jordan & Katharine Sell (Trinity Western University) DavidJ@twu.ca</p>

	<p>The Blaauw Eco-forest is a 14.2-hectare property, located south of the Fraser River in the northeast corner of Langley, BC. The Blaauw Eco-forest, which is currently owned and managed by Trinity Western University, comprises a number of Coastal Western Hemlock (CWH) habitats, including mixed deciduous and coniferous second growth forest, a small pond/wetland complex and a remnant peat bog. The objectives of our research include exploring the successional dynamics and environmental history of the site. We employed multiple sampling methods in order to help accomplish our objectives. We collected 68 increment cores from five different living tree species including western hemlock (<i>Tsuga heterophylla</i>), western redcedar (<i>Thuja plicata</i>), paper birch (<i>Betula papyrifera</i>), shore pine (<i>Pinus contorta</i> var. <i>contorta</i>) and bigleaf maple (<i>Acer macrophyllum</i>), and five full or partial cross-sections from dead trees. We analyzed our samples using standard dendrochronological methods and techniques, which allowed us to construct two site-specific ring-width chronologies for western redcedar and calculate age estimates for the other tree species. Analysis of the two samples from the older second growth area and remnant bog site revealed series intercorrelation values of ($r = 0.452$; $p < 0.01$ and $r = 0.433$; $p < 0.01$), and mean ages of (87.4 years and 74.2 years), respectively. One sampled shore pine tree exhibited the oldest uncorrected age estimate of 151 years. The preliminary results suggest a complex successional history based on site differences within the Blaauw Eco-forest and that further research is warranted.</p>
10	<p>Spatial Analysis of Accessibility to Water Fountains at Trinity Western University Langley, B.C. 2018 Cook, Natalie & Geraldine Jordan (Trinity Western University) Natalie.Cook@twu.ca</p> <p>Drinking water and remaining hydrated is essential to human well-being and an important feature when attempting perform high-quality educational learning. Studies have shown that drinking water promotes high-quality intellectual results in students. My study assesses the spatial distribution of the water fountains at Trinity Western University's Langley campus. I created Thiessen polygons around each of the publicly accessible water fountains (i.e. I excluded kitchens, washrooms and laundry rooms from the analysis). I intersected polygons with a polygon of the geographic extent of campus. Next, I created a 50-meter buffer around each water fountain to show areas within 1-minute walking access. Finally, to determine serviceability, I performed a union of the Thiessen polygons and the 50-meter buffer zones and compared the area within the buffer zone to the Thiessen polygon area. The results showed that the largest Thiessen polygon has a surface area of 34873.8 m², the smallest has 3868.3 m² and the average polygon size was 21757.0 m². The results also showed that the least serviced polygon is on the center of campus, showing 21.1% of the surface area is serviced with convenient access to a water fountain and the most serviced polygon is on the western area of campus, displaying that 92.1% of the surface area is serviced. This study showed areas on campus that are underserved by water fountains. This study enhances the need of awareness to water fountain accessibility and can be a resource for possible future water fountain implementation proposals.</p>
11	<p>Analysis of Grinnell, Sperry, and Athabasca Glacier Using Repeat Photography Dalton, Holly (University of Lethbridge) holly.dalton@uleth.ca</p>

	<p>Ever since the development of photography in the mid-1800s, it has been used to document change. Today multi-temporal imaging continues to be a valuable tool for evaluating differences in landcover. Two of the most interesting contemporary uses of repeat photography are the USGS Repeat Photography Project (1997-present) and the Mountain Legacy Project (1996-present). These two projects helped to illustrate how changing climate was impacting water storage in alpine regions of western North America. Resources survey images were taken in the late 1800s through to the late 1900s then replicated in recent years from the same vantage point, with a similar camera and with a comparable field of view. When compared side by side, these paired images showed measurable changes in the landscape – most notably the retreat of glacial ice. Sperry Glacier and Grinnell Glacier in Glacier National Park (MO) and the Athabasca Glacier (AB) are three glaciers that have exhibited a dramatic reduction in mass over the last century. Going forward this could mean reduced water availability for downstream communities. Since 1900, Grinnell Glacier decreased from 530 to 298 acres. In 1901 Sperry Glacier covered 800 acres, and by 1960 it had shrunk to 287 acres. Since 1870, Athabasca Glacier has shrunk 1.5x in volume at a rate of 13 metres annually. These rates of glacial retreat continue today. This literature review poster illustrates the scale of the changes measured using multi-temporal imaging (repeat photography) during the MLP and USGS RPP.</p>
12	<p>Reconstructing Fire History in the Teanaway Community Forest, Washington Deardorff, Emily; Johnson, Sophie; Luke Telfer & Megan Walsh (Western Washington University) deardoe@wwu.edu</p> <p>In 2017, the Jolly Mountain Fire burned a total of 14,895 hectares over the course of three months, causing widespread health concerns and warranting the evacuation of the Teanaway Community Forest and parts of surrounding communities. Intensifying wildfire activity in Central Washington in recent years due to warming temperatures has increasingly occupied the public consciousness as more homeowners in this region feel the effects from burns. Large wildfires such as this demonstrate the importance of understanding historical burn patterns of our forested land, especially how those areas have responded to human fire suppression activities and climate change. The purpose of this research was to reconstruct the fire history of the Teanaway Community Forest and to better understand the causes of fire regime changes over time. This was constructed using macroscopic charcoal analysis of a sediment core from Camp Lake, located roughly in the center of the Teanaway Community Forest. Two short sediment cores and one long core were taken and analyzed at one-centimeter intervals for macroscopic charcoal content, charcoal morphotypes, magnetic susceptibility, and organic content using loss-on-ignition. The results show a recent charcoal peak, from the Jolly Mountain Fire, followed by a period of fire suppression, likely spanning much of the last century. Prior to this period, there are semi-regular intervals of high charcoal peaks, indicating intense fires, with smaller or no peaks between them, indicating smaller intensity fires. This pattern suggests that fuel built up in the smaller fire periods, resulting in the risk of large and intense wildfires. Following this pattern, there is a risk of a severe wildfire occurring in this region soon because there have been small to no charcoal peaks in about the top 50 centimeters of the core. This risk is compounded by the effects of climate change, which is causing increased fuel dryness and temperatures and a decrease in humidity, resulting in a longer fire season. Understanding the danger that fuel build up and climate change pose is vital for forest managers. By studying the long-term fire behavior in this area, those involved in forest management can better mitigate fire risks in this region by</p>

	implementing tree thinning, controlled burns, and public outreach into their management plans.
13	<p>Infrastructure Changes on Trinity Western University Campus, Langley, BC, 2001-2018 Dixon, Brendan (Trinity Western University) dixonbre@gmail.com</p> <p>Trinity Western University (TWU) has steadily grown as an academic institution, resulting in physical changes to its main campus in Langley, British Columbia (BC). Using Geographic Information Systems (GIS), I was able to create an updated geodatabase of TWU's campus and model how its infrastructure has changed between 2001 and 2018. This allowed me to determine the change in area of campus buildings, cement paths, and parking lots, as well as calculate the walking distance along paths. My results showed an increase in area of buildings (+20%) and cement paths (+16%), but a decrease in parking lot area (-7%). Scenarios of hypothetical pedestrian travel were shown to be fairly stable despite path alterations. Considering an increase in student population, the decrease in parking lots is a reasonable concern. This project shows the importance of spatial analysis and the potential of GIS for campus planning.</p>
14	<p>Investigation of water quality and treatment options for <i>Myriophyllum aquaticum</i> Dutt, Philipa (University of the Fraser Valley)</p> <p><i>Myriophyllum aquaticum</i> (<i>M. aquaticum</i>) commonly known as Parrotfeather, is an invasive herbaceous aquatic plant native to warm-temperate regions in South America, however, it has now been introduced globally. Due to numerous invasions in water bodies in Abbotsford, BC, there is an urgency to find a treatment. This investigation focuses on water quality and treatment options to remove <i>M. aquaticum</i> permanently from unwanted areas. Water samples were obtained by systemic sampling. "Growth" samples were acquired from water within an inch of the <i>M. aquaticum</i> growth on multiple sites at the location and the "no-growth" samples were acquired from water two feet away from the closest <i>M. aquaticum</i> growth in the water at the same location. Tests were performed to determine pH, total alkalinity, nitrate and phosphate levels, and total hardness. Results indicated that nitrate and phosphate levels are limiting factors in <i>M. aquaticum</i> growth. Therefore, to control and prevent further invasions of <i>M. aquaticum</i>, nitrate and phosphate levels in water need to be managed. Previous treatments were discussed and future treatments suggested.</p>
15	<p>Power and Fish: The Colombia Basin's Role in Cross Border Relations Ericson, Alexander & Kiley Larsen (Western Washington University) ericsoa@wwu.edu</p> <p>The Colombia River Basin (CRB), reaching from Alberta to Idaho and Washington to Montana, is operated by international agencies under the Columbia River Treaty (CRT). The purpose of this paper was to look at the agencies in both the US and Canada involved with the hydroelectric economy of the CRB and the impacts of dam structures on regional ecosystems. The impacts on salmon were noted, but only in relation to dam structures to avoid broadening the subject matter of this paper. The primary research of this paper was the synthesis of scholarly journals, as well as observing the current negotiations over the CRT. The international relations developed by the CRT are beneficial to both parties, but the</p>

	effects of river management along the Columbia River have changed the landscapes and ecosystems of the CRB.
16	<p>The ethics, applications and practice of technologizing community asset mapping Fall, Alicia (University of Victoria) aliciacmfall@gmail.com</p> <p>Community mapping is a powerful tool to gather and share knowledge in an accessible way. Previous research has established that the collaborative and participatory approach of community mapping, which values local and alternative knowledge, provides beneficial opportunities for building social networks and instilling pride of place. There is growing interest in technologizing community mapping, yet limited research has examined how technology influences the community engagement process offered by this tool. This study considers how moving towards digital mapping methods may enhance or limit benefits of the community mapping process by exploring the nuances of digital access and literacy among disadvantaged adults in Victoria, BC. Community mapping has been utilized in various forms by various organizations including BC Housing (BCH), the provincial provider of rental assistance and subsidized housing. The inaccessibility of adequate housing in Victoria is exacerbated by social barriers and economic inequalities and the populations BCH serves often rely upon community services to meet everyday needs. One of the ways BCH hopes to connect tenants with services that may improve quality of life is through mapping relevant neighbourhood assets within walking distance of housing sites. This research will explore the response of residents in Vancouver Island's largest BCH community to the inclusion of technology throughout the community mapping process. This presentation allows us to understand how digital technologies may influence emancipatory potentials of community mapping.</p>
17	<p>'Blue space' as public space: a case for a bottom-up integrated design approach to propose a harbour bath concept in Victoria, BC. Fleming, Tamara (University of Victoria) tamara.fleming@shaw.ca</p> <p>This paper proposes the use of 'blue space' as public space in the context of Victoria, BC by utilizing the downtown harbour as a leisure centre in the form of a harbour bath. It is argued that a harbour bath will benefit social, economic, and environmental sustainability in the region through inclusive & playful design for a healthy public sphere, positive effects on the tourism industry, and promote remediation of the harbour. An in-depth literature review was conducted on peer-reviewed articles regarding blue space, playful design, and inclusive design to further the argument. The Copenhagen harbour baths were researched as a main source of inspiration, showcasing the success of the project in social, economic, and environmental aspects in a city with similar identified values and climate. A main finding in the research is the importance of a bottom-up, integrated design approach for continued success and sustainability of the project. This can be done through community involvement in the planning process to determine stakeholder needs and work within the local context. The paper concludes by stating a harbour bath project could help the City of Victoria achieve its vision of being an urban sustainability leader and create a democratic public space that permeates the edge between the waterfront and harbour. No specific site was identified for the project, as an integrated design methodology must first be created to ensure best practices.</p>

18	<p>Invasive Knotweed (<i>Fallopia sp.</i>) and Thimbleberry (<i>Rubus parviflorus</i>) Leaf litter Decomposition in Freshwater Streams of the Fraser Valley Gillies, Sharon L.; Janmaat, Alida; Marsh, Steven; Shyna Kanda & Ashleigh Yakemchuk (University of the Fraser Valley)</p> <p>The introduction of invasive Japanese knotweed to North America has resulted in the displacement of several native species. Knotweed can be found in dense stands in riparian areas. The lower nutrient levels of knotweed leaves changes the composition of riparian leaf litter input and may affect aquatic food webs. A comparison of knotweed leaf litter to leaves from the native shrub thimbleberry (<i>Rubus parviflorus</i>), was conducted in eleven sites on eight freshwater streams in Abbotsford British Columbia in 2014. In 2015, only one freshwater stream was used, and mixed leaf litter of knotweed and thimbleberry were used. We found knotweed had a much lower C:N ratio of 13.99 compared to thimbleberry with a 21.46 ratio. Decomposition rates of thimbleberry were significantly higher than knotweed, but no significant different in the Shannon diversity index of the macroinvertebrates, but a higher abundance of Plecoptera shredders were found in the knotweed leaves.</p>
19	<p>Wolf Migration Across Political Borders in the Pacific Northwest Hagopian, Grayson & Huck McClaran (Western Washington University) mcclars@wwu.edu</p> <p>The boundaries of research include any area/region in the Grey Wolf's natural or traditional habitat spanning the border. This includes Northern U.S states such as Washington, Idaho, Montana, North Dakota, and Minnesota - and Southern Canadian provinces such as B.C, Alberta, Saskatchewan, Manitoba, and Ontario. It is clear that there are physical borders impeding native wolf populations from safely crossing the Canada/ U.S. border as well as human development (roads, parks, and urbanization) as a result of the creation of said border. We have utilized any and all secondary resources available to us, including a prior graduate thesis regarding this same area of study, as well as any statistical and otherwise informational sources. This includes analyzation, collection, and refinement of data. This study demonstrates that socio-political borders as the result of differences in government structures will negatively affect native wolf populations and migration patterns.</p>
20	<p>The Private National Parks of Donald Trump Harvey, Bronwyn (University of Victoria) bee.harv1@gmail.com</p> <p>The most complex systems forming human societies are dependent on the biodiversity of Earth's ecosystems. Our food, resource industries, and health depend on a rich diversity of species to shield against environmental disturbance and/or extinction. Consequences of massive biodiversity loss would be global and long lasting (IUCN, 2018). Watchdogs and governing bodies, including the United States, have long determined that the best method for preserving global biodiversity is to set aside areas of land and water to be protected from human activity (IUCN, 2018). Yet, in recent years the rise of right-wing populist rhetoric in the United States has led to the reshaping of some governmental policies relating to national park and protected areas management. More specifically, under the current administration and under the Presidency of Donald Trump, a form of right wing conservatism seems to be shifting management policies away from the preservation of wilderness to more privatized, resource extractive activities within public lands. At the moment, underfunded national</p>

	<p>public lands represent the limited empty space remaining in the United States: untouched and primed for a change in policies regarding how they are managed. I intend to present a poster on research I have conducted; highlighting political actions that are already impacting national public lands. By analyzing Trump's politics and policies associated with national parks and protected areas, I hope to hold a discussion focused on how effective park management can be for biodiversity protection, in the face of rising political protectionism.</p>
21	<p>There and Back Again: A Least-Cost Analysis of Lord of the Rings Hodgson, Jim; Deanna Shrimpton & Maegan Poblacion (University of British Columbia) jshodgson@gmail.com</p> <p>Set in the fictional universe of Middle Earth, the Lord of the Rings trilogy follows the hobbit Frodo Baggins and his companions on their journey to destroy the One Ring. In a shifting sociopolitical, physical, and fantastical landscape it can be difficult to find the best path to reach your destination. The goal of this project was to apply GIS least-cost analysis to Frodo's path to determine the most efficient path for him to take, while still arriving safely at his destination. The process of finding the "best" path, defined here as the fastest safe path, requires purely imaginary data. An exercise in reasonable estimates and assumptions, we model as many of the social and physical factors that would impact the hobbits' route as possible. This includes things such as roads vs. wilderness, proximity to orc armies, the dreaded Ringwraiths, travel by boat or by land, and even the difference between walking uphill and walking downhill. The discussion revolves around validity of data, the criteria by which reasonable assumptions are made, modelling the change of social factors through time, and why Frodo didn't just take the eagles. The result is a series of maps representing Middle Earth, the various factors controlling the Fellowship's movements, and most importantly the optimal path for them to arrive safely and quickly in Mordor. We found that Frodo did not take the quickest route, arriving a full two months later than he does in our model with a few major diversions from his original route.</p>
22	<p>Death by a thousand compounds: Persistent Organic Pollutants and Killer Whale Toxicology Johnson, Dana (University of Victoria) dana.johnson.contact@gmail.com</p> <p>Persistent Organic Pollutants (POPs) are ubiquitous throughout the biosphere, and are known to have deleterious health effects on species across trophic levels. Rachel Carson's seminal work Silent Spring brought international attention to the dangers that indiscriminately high uses of pesticide, herbicide, and other chemical compounds pose to all life on earth. Her scientific rigour and poetic evocations documented the loss and destruction of ecosystems, igniting a movement and bringing international attention to an already accelerating ecological crisis. These long-term, persistent, and uncontrollable compounds are capable of drifting and "hopping" through the atmosphere, far from the source of contamination. This is most alarmingly revealed in biopsies of marine species, with high levels of contaminants found incredibly far distances from the source of contamination. Species at the greatest risk for chronic exposure and subsequent bioaccumulation are apex predators, especially those in aquatic ecosystems. Coastal communities and resident marine mammal populations are highly vulnerable. Widespread use of POPs in the last century has resulted in their anthropogenic introduction into environments and biota, deliberately, or inadvertently as toxic by-products. A majority of the world's Killer Whales populations are now at risk of collapse. As human and cetacean alike risk the health of future generations through exposure</p>

	<p>to POPs, it is critical to divest our needs from reliance on their production. These large, blubbery, cosmopolitan, beautiful marine mammals are anatomically prone to the sublethal effects that result from pollutants. Whales may not be able to endure the brunt of our consumption and waste: from plastic to radioactivity, cigarettes, and insulation.</p>
23	<p>Spatial Analysis of Japanese Knotweed (<i>Reynoutria japonica</i>) Chemical Spray Treatments in the District of Mission, BC (2013 – 2018) Jones, Vanessa (Trinity Western University) Vanessa.Jones@mytwu.ca</p> <p>Japanese knotweed (<i>Reynoutria japonica</i>) is an extremely invasive plant throughout North America, and has recently become a significant threat in the District of Mission, BC. Using Geographic Information Systems (GIS), I analyzed knotweed point data from the Invasive Alien Plant Program (IAPP), including location and dates of chemical sprays with Roundup, a commonly used herbicide. I found that 78% of knotweed points within the study area had been sprayed, and created a histogram showing that most were sprayed from 2014 onward. The resultant map of sprayed and unsprayed sites will be useful for determining areas to focus future knotweed control efforts. I created a kernel density map showing 2 areas of high knotweed density, one in the north and one in the south of the District of Mission; both with densities of 3.01 - 4.50 sites per km². Roundup does not always kill knotweed after one application; as a result, sites that are sprayed multiple times are more likely to develop resistance to glyphosate, the active ingredient. To investigate this phenomenon, I performed nearest neighbour analysis, resulting in no clustering of knotweed sites that had been sprayed more times compared to a random distribution. The resultant map displays knotweed sites that may be more likely to develop Roundup resistance, and can thus be used to make more informed decisions about future knotweed control.</p>
24	<p>No trucks: Civic engagement helps to shape transportation planning near two elementary schools in the Township of Langley, BC Jordan, Geraldine (Trinity Western University) Vanessa.Jones@mytwu.ca</p> <p>Japanese knotweed (<i>Reynoutria japonica</i>) is an extremely invasive plant throughout North America, and has recently become a significant threat in the District of Mission, BC. Using Geographic Information Systems (GIS), I analyzed knotweed point data from the Invasive Alien Plant Program (IAPP), including location and dates of chemical sprays with Roundup, a commonly used herbicide. I found that 78% of knotweed points within the study area had been sprayed, and created a histogram showing that most were sprayed from 2014 onward. The resultant map of sprayed and unsprayed sites will be useful for determining areas to focus future knotweed control efforts. I created a kernel density map showing 2 areas of high knotweed density, one in the north and one in the south of the District of Mission; both with densities of 3.01 - 4.50 sites per km². Roundup does not always kill knotweed after one application; as a result, sites that are sprayed multiple times are more likely to develop resistance to glyphosate, the active ingredient. To investigate this phenomenon, I performed nearest neighbour analysis, resulting in no clustering of knotweed sites that had been sprayed more times compared to a random distribution. The resultant map displays knotweed sites that may be more likely to develop Roundup resistance, and can thus be used to make more informed decisions about future knotweed control.</p>

25	<p>Biodiversity Case Study: Range Change of <i>Bombus occidentalis</i> Lipka, Jennifer (University of British Columbia) jlipka00@gmail.com</p> <p>Many challenges face <i>Bombus occidentalis</i>, a small, short-tongued bumblebee species native to western North America. It used to be common throughout its range but over the last 20 years has become locally extinct in many areas with a significant loss of abundance. There is increasing evidence indicating that parasites, pesticides, habitat loss and climate change negatively affect this bee's distribution. While extensive research exists for honey bees, little research into the lives of bumblebees has been conducted and much is still unknown. This case study delves into the complexity and interconnectedness of the many factors which have led to a range change for <i>Bombus occidentalis</i>. The natural and evolutionary history of <i>Bombus occidentalis</i> is discussed as well as its specific attributes and traits. Furthermore, future concerns for the species and conservation strategies are addressed.</p>
26	<p>An investigation into the possible effects of land use on turbidity and suspended sediment concentrations throughout historical seasonal discharge rates. MacMillan, Emily; Marsh, Steven; Gillies, Sharon; Peucker-Ehrenbrink, Bernhard; Toews, Donovan; Toohey, Ian; Luwana Louis & Lise Nehring (University of the Fraser Valley) emilyrm@telus.net</p> <p>The Fraser River located in British Columbia, Canada is a vital component of the Lower Mainland's ecosystem that has fallen victim to the consequences of an ever-growing urbanized society. As land use continues to thrive and expand, ecological changes occur that alter the physical and chemical make-up of this sacred waterway. As the heart of the Lower Mainland, the Fraser amasses a drainage area of 217,000 km² that feeds into the Pacific Ocean. Annually, the Fraser carries approximately 32 million tons of sediment into the Pacific with the majority of transportation occurring during the spring freshet when flow rates peak. Nearly 90% of this sediment is suspended within the water column. The focus of this study was to trace total suspended sediment and water clarity throughout the seasonal discharge trends to infer on whether they are followed. As well, historical data is to be inspected for alterations in these values over time as a way to monitor the detrimental impact that by-products of land use have invoked upon this waterway. Levels of total suspended sediment during these influxes were examined over 8 years by means of in situ experimental turbidity data taken from Fort Langley, British Columbia. Further historical data was obtained from Environment Canada in order provide further information on sediment concentrations and discharge rates throughout the Fraser. Correlational analysis is to be conducted in order to determine the possibility and strength of the relationships between turbidity and discharge, sediment concentration and discharge, and lastly turbidity and sediment concentration.</p>
27	<p>Pro-Environmental Behavior and Local Food Production in Kamloops, BC Martens, Hanna (Thompson Rivers University) hannamartens@hotmail.ca</p> <p>This poster will explain the findings from research conducted in the Summer of 2018 on pro-environmental behavior in local food producers and motivation to produce food within the Kamloops area. Data was gathered through interviews and surveys of small-scale food producers (included both household food production and local farmers) to understand why</p>

	<p>individuals were choosing to grow their own food and if they were motivated by environmental reasons, and whether they demonstrated environmentally friendly behavior both in their food production and their lifestyle. Given the state of the environment, it is important to understand what motivates environmentally friendly behavior. My research found that individuals who grew their own food demonstrated environmentally friendly behavior within their food production (composting, no pesticides, etc.), but were no more likely to be environmentally friendly in their lifestyle (reducing energy usage, reducing meat consumption, etc.). I also found that individuals who were motivated to grow food to connect with nature or to reduce their environmental impact displayed more environmentally friendly behavior both in their food production and their lifestyles than those who were not motivated by environmentally friendly reasons or a desire to connect with nature. This research highlights the gap between engagement in environmentally friendly activities and a resulting environmentally friendly lifestyle. While urban agriculture and local organic agriculture has inherent environmental benefits, engagement in this activity does not result in more environmentally friendly lifestyles.</p>
28	<p>A Reassessment of Industrial Impact on Our Rivers Martens, Rayna & Sydney Speers (The King's University) raynalmartens@gmail.com; sydney.speers@lab.kingsu.ca</p> <p>Canada is the sixth largest producer of fossil fuels worldwide, and sixteenth in terms of coal extraction and production. To address climate change, Canada has initiated a plan to allay the threats. Unfortunately, mining firms in Alberta continue investments into the growth of the industry despite federal issuance of regulatory frameworks. It is apparent that recognition of the damage caused to Alberta's ecosystems by the coal industry has yet to be reached. Plenty of organizations exist to monitor the water quality of Canada's rivers. However, these tests assess merely microbial activity. This project seeks to prove that such examination methods are insufficient when testing downstream from coal mines, as it does little to account for levels of highly dangerous contaminants—such as inorganic and organic mercury. This research project will strive to increase publicly-understood information of our local watershed, in order to inform Albertans of the real threats at hand. To study the impacts of coal-fired electricity we will conduct interviews with the three fundamental categories of civil society: promoters or policy advocates, environmentalists, and technologists or organizations. We will also thoroughly review conservation policies of nearby Alberta mines, and of our local water treatment facility: Goldbar Wastewater Treatment Plant. These methods will aid in uncovering data about the natural and anthropogenic sources of inorganic and organic mercury, and what is being done to protect the marine ecosystems of our watershed from further damage.</p>
29	<p>Sport Fishing Regulations in British Columbia, Canada and Washington State, U.S.A. Montgomery, Alice (Western Washington University) alicemontgomery193@gmail.com</p> <p>Sport fishing regulations throughout the Salish Sea region vary across the international border between Washington State and British Columbia. This study addresses the factors that have influenced regulations on limits regarding size, amount, and types of species. It also examines the social, economic, and environmental implications of these regulations. Although each country has different guidelines and concerns surrounding how to manage</p>

	<p>sport fishing in this borderland, both have similar values regarding population, environment and the future of saltwater fish in this region.</p>
30	<p>Managing Wolf Populations in Alberta Nand, Jeshween & Zachary Vander Heide (The King's University) Jeshween.nand@lab.kings.ca; Zachary.vanderheide@lab.kingsu.ca</p> <p>Wolf populations have been affected by many factors that are mainly human induced. Wolves are often viewed as pests when entering areas of human settlement. Predators such as wolves, however, are essential to maintaining healthy ecosystems. Recovery plans for species affected by wolves have resulted in efforts to control wolf populations from becoming too large or too sparse depending on the location. Currently, Alberta is trying to contain wolf populations to 4000, and related management practices have resulted drastically fluctuating wolf populations. Alternative measures of population control are needed to be more consistent so that populations are not in fluctuation and to ensure they are conducted in an ethical manner pertaining to how wolves are killed or captured for relocation. Our poster will evaluate the current wolf management program in Alberta as well as the methodology involved. Through an extensive literature review we intend to better understand the programs and its associated shortcomings associated. Through ongoing research on the effects of tag regulations, video surveillance, accurate population counts as well as the procedures in which wolf populations are controlled, we are hoping to find a better solution for managing wolf populations and their interactions with humans as well as their prey in Alberta.</p>
31	<p>Inclusive Public Space: How can the City of Victoria create an inclusive public realm? Nyren, Jack (University of Victoria) jacknelsonnyren@gmail.com</p> <p>This project discusses the creation of inclusive urban public spaces, with a focus on Victoria's Centennial Square and the municipalities ongoing revitalization of the space. The study investigates: the reasons, values, and processes behind the renewal project; the interests of current users (with a focus on marginalized populations); and the extent to which the city considers these user interests. A comparative case study involving Centennial Square and Folket's Park (Copenhagen, Denmark) will seek to set up a best practice moving forward for the City of Victoria. The study uses three methods of data collection: municipal document analysis; observational research; and interviews conducted both with resident and international planners, as well as users of Centennial Square. The analysis of municipal documents will inform my interviews with local planners and will shed light on the city's goals, objectives, and plans for the square. Observational research will allow for a better understanding of social contexts of the square, and the identification of vulnerable user groups. Interviews with local and international planners will give me insight on differences between how the City of Victoria and the City of Copenhagen incorporate the voices of the public, with a focus on marginalized populations, in the recreation of inclusive public space.</p>
32	<p>Drainage and Road Influences on the Distribution of Knotweed (<i>Reynoutria sp.</i>) in Langley, British Columbia Oeggerli, Virginia (Trinity Western University) virginiaoeggerli@gmail.com</p>

	<p>Japanese and Bohemian knotweed are invasive plant species throughout North America with a method of distribution that is still unknown. In recent years, knotweed has become a significant threat throughout the Lower Mainland of British Columbia (BC). I used Japanese and Bohemian knotweed point data collected from the Invasive Alien Plant Program (IAPP) to spatially analyze the relationship between the two species and roads and drainage systems through the utilization of Geographic Information Systems (GIS). I found that there is a significant number of knotweed sites found in close proximity to roadways when compared to a randomly distributed data set. Drainage channels did not have a significant number of knotweed points in proximity to them when compared to a randomly distributed data set. It is worth noting that roads are more frequented than drainage channels, hence the potential for more sightings. I found that 72% of knotweed sites were within 15m of a roadway and 74% of knotweed sites were within 30m of a drainage channel. Finally, I found that 58% of knotweed points are within riparian areas that intersect with roads. These areas are flagged as possibly high-risk areas for the spread and distribution of knotweed.</p>
33	<p>Transnational Environmental Representation: Canadian and American Landscape Paintings during the 19th Century Oshio, Kazuto (Sophia University) k-oshio@sophia.ac.jp</p> <p>The purpose of our project is to question the nation-centered categories of landscape art history and to suggest the possible paths to trans-nationalize it by particularly examining the exhibition, ""Expanding Horizons: Painting and Photography of American and Canadian Landscape 1860-1918"" (Montreal/Vancouver Fine Art Museums, 2009). In fact, as art and geography have long been intertwined, landscape painting is a source for geographical research. Geography, according to Otto Schluter for instance, is defined as landscape science. Therefore, geographers have emphasized the usefulness of landscape painting in the study of places. A natural landscape is made up of mountains, hills, plains, plateaus, lakes, streams, soils, and natural vegetation, not confined within man-made boundaries. Yet, traditionally landscape art has been studied within national(istic) framework. Our transnational examination of the 19th Century American and Canadian landscape paintings hopes to reveal the emerging consciousness of "nature" and cultural divergence between neighbors in an era of shared territorial expansion. By analyzing the similar and differing intentions underlying their creation, their complementary yet distinctive compositional structures and styles, and their choices of subjects, this paper makes a case that natural landscape artists' work did not just passively record scenes at critical period in the history of both the United States and Canada. Ultimately it suggests North American Area Studies, rather than "closed" American or Canadian Studies in a globalizing world.</p>
34	<p>Sources of fine-grained sediment in a large regulated watershed in British Columbia using the sediment fingerprinting technique Owens, Philip; Gateuille, David; Petticrew, Ellen; Booth, Barry; Todd French & Kristen Kieta (University of Northern British Columbia) Philip.Owens@unbc.ca</p> <p>Sediment dynamics in most large river basins are influenced by a variety of different natural and anthropogenic pressures, and disentangling these cumulative effects remains a challenge. This study determined the contemporary sources of fine-grained (<63-µm) sediment in a large, regulated river basin and linked sources to activities in the basin. The river has seen declines in chinook salmon, sockeye salmon and the endangered Nechako white sturgeon</p>

	<p>populations, and sediment (both fine-grained and sands) has been identified as a potential cause of these declines. Samples of suspended sediment and potential source materials were collected from numerous sites distributed throughout the upper Nechako River Basin in British Columbia. Discriminating fingerprint properties were used within the MixSIAR model to apportion sources amongst sub-basins and land use types. Results were compared to records of precipitation and Nechako River discharge trends, and to changes in landscape development. Contributions from the erosion of channel banks dominated the suspended sediment load at most sites. Changes in sediment sources during the 2015 field season reflected snowmelt and patterns of water release from the Nechako Reservoir that affected the sediment carrying capacity of tributaries and the Nechako River main stem. Spatial variations in 2015 also reflected the distribution of land use (e.g., forested or agricultural land) as well as topography (e.g., slope steepness). The sediment source fingerprinting technique, in combination with information on the hydrometeorology and the land use and river management in the basin, have provided valuable information with which to understand sediment dynamics in the Nechako River Basin. Such an approach can help to disentangle how large river systems respond to a combination of natural and anthropogenic pressures.</p>
35	<p>Mountains of Paperwork, Forests of Laws: Challenges in Forming “Territories of Traditional Nature-Use” in Southern Yakutia Parlato, Nicholas (University of Northern British Columbia) parlato@unbc.ca</p> <p>In the Russian North and Far East, Indigenous leaders and communities representing over 40 different cultural groups have succeeded in preserving traditional ways of life, and particularly nomadic reindeer husbandry, through all the enormous political, social, and environmental changes of the past century. To ensure continued cultural survival in the young democratic-capitalist phase of Russian history, Indigenous peoples have employed and developed a wide range of political and legal instruments, processes, and bodies both within and without Russian governance structures. Key among these instruments is the “Territory of Traditional Nature-Use” (TTP), a legally-recognized, geographically-bounded cultural landscape within which dozens of normative republican and federal acts, constitutional laws, and codices regulate traditional and industrial natural resource use. Though legislation regarding TTPs has existed at the federal level since 2001, a lack of sub-acts and the limitations of regional laws has made the process of TTP formation obscure and piecemeal. Indigenous communities and government officials in Republic of Sakha (Yakutia), however, have succeeded in creating 59 TTPs since 2006, covering 60% of the area of the republic. Based on research conducted in the Aldan District of Southern Yakutia in summer 2018, this poster aims to elucidate how Indigenous leaders have navigated bureaucracy, legal formalities, and political obstacles to establish TTP protections for their homelands.</p>
36	<p>Mapping Renewable Energy Projects in Canada Patel, Sonak (University of Alberta) sonak@ualberta.ca</p> <p>This poster presents the renewable energy landscape in Canada through a map of renewable generation projects with a capacity over 1 MW and graphs of renewable energy by time and by type. As the first phase of a larger project seeking to understand the intentions and decisionmaking of communities considering developing renewable energy projects, this map and the temporal and provincial data illustrate spatial trends for renewable energy adoption</p>

	<p>in each of the provinces. The map shows the dominance of hydropower in BC, Manitoba, Ontario, and Quebec. Wind generators dominate southern Canada, notably in the Prairies, and the Atlantic Coast. Biomass generation is focused around forestry operations in BC and Alberta, as well as landfill gas facilities in some cities. Solar photovoltaics are less prevalent as utility scale projects over 1 MW, but much more common as smaller microgenerators. The map also displays projects in development, providing some indication of how the renewable market will be changing in the near future. For each province, the total renewable capacity is presented as a percentage of the total energy capacity, showing the varying provincial efforts to add renewables to the energy market. The poster also describes the next steps for this project, including objectives and anticipated outcomes. The project will contribute to an in-depth understanding of the constraints and opportunities for renewable energy development.</p>
37	<p>Deadly Counterfeits or Life Saving Medications? A Critical Analysis of the American Gray Market for Canadian Pharmaceuticals Reed, Christopher (Western Washington University) reedc9@wwu.edu</p> <p>This research project examines why high drug prices cause Americans to cross the border to fill their prescriptions at Canadian Pharmacies, the quality control issue of unregulated foreign drug sellers posing online as “Canadian pharmacies” to sell counterfeit untested medicines, and the legality of cross-border pharmaceutical reimportation. Based on scholarly literature and drug pricing data, I show the correlation between increasing drug prices and American willingness to increase their risk in order to get these drugs at a cheaper cost.</p>
38	<p>The Use of Passive Remote Sensors for Marine Oil Spill Detection Roessingh, Desmond & Maya Munzar (University of Victoria) desmondroessingh@gmail.com; m.munzar@shaw.ca</p> <p>While air and space-borne active remote sensing platforms have been put to use detecting and quantifying marine oil spills for the past several decades, their use has been limited by their high cost of development and use. This study aims to explore the effectiveness of existing ocean remote sensing platforms to detect and quantify marine oil spills, which, if successful, could be used on a global basis to detect offshore spills that might otherwise go unreported. Samples of diesel, hydraulic oil, and bunker fuel at 2.5, 25, 100, and 200 um thicknesses (on water) were sensed using a handheld hyperspectral sensor in a contained environment. The hyperspectral data was then converted to simulated MODIS Aqua and Sentinel-3 bands, which were chosen based on their bands coinciding with distinct spectral characteristics found in the oil samples. Finally, the reflectance values of each thickness of each oil, and of an average oil thickness (obtained by averaging the reflectance of each individual oil thickness) were compared with water reflectance values to determine if they were significantly spectrally separable.</p>
39	<p>Size Matters: Stemflow, Soil-Water Recharge and Spatial-Scaling Rusnell, Breena; Narain Spolia & Darryl E. Carlyle-Moses (Thompson Rivers University) dcarlyle@tru.ca</p> <p>Forests and other vegetation communities can play an important role in the volumetric importance and spatial distribution of rainfall that reaches the soil surface to partake in the terrestrial portion of the hydrologic cycle. Vegetation canopies can intercept and store</p>

	<p>rainfall, evaporating it back to the atmosphere (interception loss). That portion of rainfall not partitioned into interception loss does not reach the ground in a spatially uniform manner. Instead, the drainage of rainfall can take the form of throughfall – passing directly through canopy gaps or dripping/splashing from the canopy, or stemflow – flowing down the boles of trees and stems of other plants. Historically, much interest was placed on the amount of rainfall that was partitioned into interception loss as it may represent a sizable fraction of rainfall not available for tree growth or streamflow. Interception loss is estimated as the difference between rainfall incident on the canopy and the sum of throughfall and stemflow with interception estimates typically made at the forest plot-scale and extrapolated to the watershed-scale. As such, the volume of stemflow is artificially distributed over these larger areas even though stemflow is confined to a relatively small region around the base of trees and stems of other plants. We apply recently advocated for stemflow metrics to previously published stemflow data from around the globe to show that, when viewed from the appropriate scale, the depth of stemflow reaching the soil in the proximal area of the base of trees and other plants is far from inconsequential.</p>
40	<p>Using GIS to Assess Nature Trail Accessibility and their Proximity to Aquatic Habitats at Trinity Western University, Langley (BC) 2018 Sarchet, Aurora & Geraldine Jordan (Trinity Western University) geraldine.jordan@twu.ca</p> <p>Natural areas can be avenues for recreation, and also for learning about and valuing ecosystems and the organisms that inhabit them. However, human activity has the potential to negatively impact natural ecosystem areas. Trinity Western University (TWU), located in Langley, British Columbia, maintains and has access to several trails in natural areas. The trails are mainly located in the Ecosystem Study Area (ESA). It is imperative to create trail accessibility for the recreation and education of users while also making efforts to preserve the ESA. Using Geographic Information Systems, we analyzed the slope of the ESA and created an elevation profile of a selected trail segment to help determine its difficulty and walkability based on elevation changes. We also buffered water bodies to consider how much of the trail system is in close proximity to sensitive aquatic habitats. We determined that the slope for terrain on and surrounding the TWU campus is between 0-3.44°. A sample trail segment had a maximum elevation of 16.1 m above sea level, a minimum elevation of 8.7 m, with an elevation change of 7.47m between the highest and lowest points. The average slope and total trail segment elevation range is not considered difficult, but there are some short steep segments that would exclude some users. We also found that approximately 47% of trails are within 9m of an aquatic habitat. Special consideration should be given to creating inclusive user access while minimizing trail impacts in these ecologically sensitive areas.</p>
41	<p>The Effects of Urban Landscaping on Groundwater Recharge Schut, Selena (Thompson Rivers University) selena.schut13@gmail.com</p> <p>This poster addresses the effects of urban landscaping on groundwater recharge. Through a literary analysis of groundwater statistics, storage, recharge mechanisms, and case studies an overview of the land cover / land use (LCLU) change and the impact it has on groundwater recharge was created. Storage of groundwater is focused on the differences between confined and unconfined aquifers in a sedimentary setting. While recharge mechanisms are limited to recharge from infiltration and recharge from surface water bodies. Urban impacts on</p>

	<p>recharge focus on the creation and subsurface alterations to the “karstification” of the city. Emphasis is placed on the LCLU changes in Kamloops, British Columbia and the effect it has on the 24 aquifers below the city. The conclusion suggests that though data on the aquifers is available, the city and province would benefit from further analysis and research as the temperature rises and the number of fires increases each year.</p>
42	<p>Detecting porphyry Cu±Mo±Au mineralization using major oxide and pathfinder elements in subglacial till in the Guichon Creek batholith, Southcentral BC Shewchuk, Cassandra; Travis Ferbey & Olav Lian (University of the Fraser Valley) cass.shewchuk@gmail.com</p> <p>Porphyry deposits are essential sources of Cu and Mo, and they account for >40% of the Cu mined in Canada. The Guichon Creek batholith, located 54 km southwest of Kamloops, BC, hosts several porphyry centres, and smaller mineral occurrences, including those at Highland Valley mine (calc-alkaline porphyry Cu-Mo). During glaciation, these mineralized sources were eroded, and commodity elements and minerals were transported down-ice in subglacial till as dispersal trains. By using evidence of ice flow direction, these dispersal trains can be tracked back up-ice to their bedrock sources, enabling the identification of new mineral sources. It is known that minerals like epidote and chalcopyrite (0.25 to 0.5 mm fraction) are indicators of porphyry deposits, and can be recovered from subglacial tills as are elements such as Cu and Mo (<0.063 mm fraction). Other till geochemical data sets such as major oxides and pathfinder elements should be able to detect porphyry mineralization but are less commonly used. For this study, existing mineralogical and geochemical data downloaded from BC Geological Survey databases will be manipulated, analyzed, and visualized using spreadsheets and GIS software, to assess the utility of major oxides and pathfinder elements as identifiers of porphyry-related dispersal trains.</p>
43	<p>Spatial analysis and vessel strike risk assessment of Humpback whale (<i>Megaptera novaeangliae</i>) behaviours in the Kitimat fjord system Shine, Chenoah (University of Victoria) chenoah.shine@gmail.com</p> <p>Expanding human industry and marine transport have lead to rising human impacts in marine ecosystems from vessel presence. Humpback whales’ (<i>Megaptera novaeangliae</i>) habitat preference for coastal marine habitat also frequented by human activity exposes them frequently to vessel traffic increasing their risk of being struck by vessels. A recently approved LNG facility in Kitimat, British Columbia will increase large, high-speed vessel traffic through the Kitimat Fjord system, which is an important Humpback whale summer foraging ground. Spatial point pattern (SPP) analysis allows for identification of patterns in habitat use. Fine scale spatial analysis focused on differences between whale behaviour are rare and have not yet been applied to inform ship-strike risk mitigation. Data was collected from boat surveys with expert observation during whale presence on the north coast during May through November over 11 years (2006 – 2016). Using a SPP analysis of humpback whales engaged in five behaviour classifications this research will compare the spatial and</p>

	<p>temporal use patterns between behaviours, and reveal changes over the seasons, and between years. A correlation analysis between ship track data and whale presence will be performed to indicate regions of greatest risk. Findings will be valuable in establishing baseline understanding of behavioural use patterns of humpbacks in the Kitimat fjord system. Results will be informative on which behaviours, regions, and months there is the greatest risk of strike to whales so that whale-vessel collision avoidance efforts can focus on these periods.</p>
44	<p>DIY Urbanism: Pop-ups, Placemaking, and Community Planning Shuttle, Steven (University of Alberta) shuttle@ualberta.ca</p> <p>‘Do It Yourself’ (DIY) urbanism is usually initiated by community members using a grassroots approach to change urban areas. Community planning involves making decisions about urban areas. This poster examines topics regarding DIY urbanism and community planning. Community engagement, neoliberalism and municipal support are key influences of DIY urbanism related to planning. DIY urbanism impacts the planner’s role as well as the relationships between planners, communities and municipalities. Three examples of DIY urbanism in Canada are introduced, including the Urban Repair Squad, PARK(ing) Day, and CITYlab. Discussion focuses on the opportunities and potential challenges of DIY urbanism for planners to consider. Potential challenges include public safety and municipal liability. Recommendations regarding DIY urbanism and community planning are provided. DIY urbanism can be beneficial if planners and community members work collaboratively to focus on small scale, low cost improvements.</p>
45	<p>The Impact of Urbanization on Bird Populations in Victoria, British Columbia Sorensen, Melina University of Victoria melinarsorensen@gmail.com</p> <p>Global urbanization is increasing rapidly, and has been shown to negatively impact bird populations through habitat degradation, biotic homogenization, and pollution (waste, noise and light). Low-frequency urban noise masks bird calls, impeding the species’ ability to mate, avoid predators, and find food. To compensate, certain species of urban birds alter their call frequency and amplitude (requiring additional energy expenditure), potentially deterring species from living in urbanized habitats. This research seeks to determine the degree to which urbanization impacts bird populations in Victoria, through a comparative study of Uplands Park and Beacon Hill Park in Oak Bay and Victoria (which is more urbanized), respectively. To the author’s knowledge, and according to the literature, there has not been a study such as this in small urban parks, on Southern Vancouver Island. A total of 1,751 observations of 43 species were recorded through five-minute point-count surveys at ten points in each park during breeding season, from April 23-June 6, 2018 (n=240 surveys). Audio was recorded during each survey to determine the ambient frequencies and amplitudes of urban noise. The audiological data and species abundance data per survey point will be used to determine any correlations between noise and species abundance at each survey point and park overall. Frequency and amplitude of american robins, chestnut-backed chickadees, chipping sparrows, and spotted towhees calls from both parks will also be compared. Along with species abundance and ambient noise data, this research will determine if urbanization impacts bird populations at the neighbourhood-scale in smaller cities.</p>

46	<p>Tourism Geographies and Alternative Imaginaries: Unsettling Discourses and Destination Branding Todd, Christine (University of Victoria) christinet@uvic.ca</p> <p>Geographic imaginaries have long been the product of Eurocentric ideals and practices, which have contributed to the misrepresentation or erasure of marginalized populations in urban centers and tourism “destinations”. This poster will illustrate some theoretical discourses which unsettle conventional representations and create space for new ways of engaging in destination representations and branding. As a first year Phd candidate, I have undertaken this initial research to shape future research into alternative geographic imaginaries which will explore and discuss the digital branding of “lifestyle” hotels (a genre focused on aesthetics, creativity and wellbeing). This research asks how lifestyle hotels perpetuate or deconstruct Eurocentric narratives. How do these hotels engage, collaborate, represent, misrepresent their locations and communities in ways that support or constrain social change? How might they be constructed differently? It asks whether sites of popular culture, such as lifestyle hotels, might participate in new forms of collaboration, engagement and representation, to showcase alternative geographical imaginaries which are more complex, nuanced and inclusive.</p>
47	<p>Impact of different urban land-use on water chemistry and dissolved organic matter concentrations at four sites along Willband Creek, Abbotsford, BC, Canada Toews, Donovan; Marsh, Steven; Gillis, Sharon; Peucker-Ehrenbrink, Bernhard; Louis, Luwana; MacMillan, Emily; Nehring, Lise; Mika Sevcik & Ian Toohey University of the Fraser Valley & Woods Hole Oceanographic Institution Donovan.Toews@student.ufv.ca</p> <p>Impact of different urban land-use on water chemistry and dissolved organic matter concentrations at four sites along Willband Creek, Abbotsford, BC, Canada Willband Creek in Abbotsford, BC, Canada is an important salmon spawning tributary to the Fraser River. It flows through a variety of different cityscape land-uses (park, wetland, city centre/industrial park, agricultural) before emptying into the Fraser River. In order to investigate the effects of urban land-use on the coloured dissolved organic matter (CDOM) and water geochemistry (temperature, dissolved oxygen, conductivity, pH, oxygen reduction potential), sampling was conducted weekly in situ at four sites along Willband Creek. Sampling was conducted using a Turner Designs Cyclops-7 Fluorometer for dissolved organic matter, YSI Professional Plus and YSI ProODO probes for temperature, dissolved oxygen, conductivity, pH, and oxygen reduction potential, and a LaMotte 2020we Nephelometer for turbidity. Preliminary findings suggest the water quality improves after the initial headwater site (urban park) as it flows through the urban wetland site before degrading as the water flows below the city centre/industrial park, and across agricultural land before joining the Fraser River. This study will shed more light on the anthropogenic effects on the water quality of this important salmon spawning stream.</p>
48	<p>Seasonal variation in water chemistry parameters Fraser River, Fort Langley, BC Toohey, Ian; Marsh, Steven; Gillies, Sharon; Peucker-Ehrenbrink, Bernhard; Toews, Donovan; Louis, Luwana Louis; MacMillan, Emily; Lise Nehring & Mika Sevcik (University of the Fraser Valley & Woods Hole Oceanographic Institution) Ian.Toohey@student.ufv.ca</p>

	<p>The Fraser River is regarded as one of the great salmon producing rivers. It flows from its source in the Rocky Mountains to empty into Georgia Strait passing through the Fraser Lowlands. Since 2010 Faculty and students from the University of the Fraser Valley have conducted time series sampling of the Fraser River at Fort Langley as a member of the Global Rivers Observatory (GRO, www.globalrivers.org) coordinated by scientists at Woods Hole Oceanographic Institution and Woods Hole Research Center. Water chemistry data has been collected biweekly including data on dissolved oxygen, temperature, pH. The Fraser River watershed is being increasingly being impacted by urbanization, industrial activity, deforestation, agricultural activity and climate change. Documenting the seasonal changes in the water chemistry along with seasonal variations in discharge will assist in understanding changes that are occurring. This knowledge will assist our attempts to protect this important salmon spawning river.</p>
49	<p>Blatchford Field Redevelopment: Struggling to Take Off Vander Vinne, Jillian & Rachel Bootsma (The King's University) vandervinne.j10@gmail.com; rachel.leebootsma@gmail.com</p> <p>The former Edmonton City Centre Airport, located in Blatchford Field, is undergoing sustainable redevelopment by The City of Edmonton in coordination with various sustainability-based companies. The project's goal is to provide housing for up to 30,000 Edmonton citizens in a sustainable community that uses one hundred percent green energy and is carbon neutral. However, the intended redevelopment has stalled and the City of Edmonton has not adequately explained why. In this poster, we intend to examine the proposed development of the sustainable neighborhood project occurring in Blatchford. We will review the intended construction, and examine the proposed sustainable, community building, redevelopment in a currently stagnant area that holds substantial potential. Our data is collected through information provided by the City of Edmonton, through web based research, environmental site assessment documents, and meetings with urban developers working on the project. We argue that this redevelopment is beneficial to the surrounding city as long as the City of Edmonton officials remain dedicated to following its projected timeline in the establishment of the sustainable community. In conclusion, the redevelopment is not merely about the Blatchford Field project; it can enable Edmonton to become an environmental leader in sustainable urban development.</p>
50	<p>Skeena River Sediment Contribution to the Skeena Estuary Wild, Amanda (University of Victoria) awildlily@gmail.com</p> <p>Over a decade of Canadian Coast Guard surveys with the Vector Vessel have produced a collection of multibeam surveys, cores, and grab samples across the Skeena Estuary. Data from multiple cruises have been compiled to produce an overview of grain size distributions on the seabed and sedimentations rates within locations across the Skeena Estuary. The model HydroTrend was used to estimate incoming sediment load from the Skeena River and compare to past estimates on fluvial contributions to the estuary. Model estimates for suspended sediments are higher than past estimates due to a large contribution of suspended sediment predicted in the portion of the watershed downstream of the Environment and Climate Change Canada hydrometric station at Usk where past predictions on basin sediment load have been made. Select locations in Ogden Channel, Below Base Sands, and within</p>

	<p>Marcus Passage have sedimentation rates as high as 2.83cm/yr and cores dominant in silt. In comparison, sedimentation rates in Chatham Sound are as low as 0.004cm/yr. The presence of turbidite channels, woody debris, high sedimentation rates, fining trends in grain size leading away from the river, and very poorly sorted sediments with a dominant presence of fine sediments were interpreted as indicators of fluvial heavy contributions to the seabed.</p>
51	<p>Garbage as a resource: Innovations at the Edmonton Waste Management Centre Wood, Christopher & Thomas de Jong (The King's University) christopher.wood@lab.kingsu.ca; thomas.dejong@lab.kingsu.ca</p> <p>Inefficient and excessive human consumption has resulted into large quantities of waste material being deposited into municipal landfills. Edmonton's Waste Management Centre (EWMC) facility aims to reduce the city's negative outputs into reusable inputs through innovative technologies. This poster aims to provide a summary of the EWMC's innovations that made it the 'cadillac system' of waste collection and transformation when first constructed. It will also explore the current condition of the processes with recommendations on how it can continue to maintain the status for innovations by exploring evidence through national and international publications on waste management innovations. Information for the poster combines the findings published by the City of Edmonton on their specific waste management processes, Government of Canada's review of Edmonton's management of solid waste and industrial materials by diverting wastes from landfill to a useable product, and the aforementioned international waste management publications. Further, interviews with select City of Edmonton waste management specialists will be conducted and recorded. The poster will highlight the City of Edmonton's innovations and shortcomings, showing the way society can rethink the notion of wastes by considering its continued use as a commodity. The EWMC's 'former' world-class innovative processes include; wastes to biofuels, landfill recovery programs, anaerobic digestion facility, e-waste recovery, waste sorting facility, with a goal to reach over 90% diversion of wastes that are destined for landfill. The combined information contributes to a broader societal perception on the purpose of waste as a reusable input than merely an unusable byproduct of consumption.</p>
52	<p>Mid-Holocene Advance of Camp Glacier, Ha-Iltzuk Icefield, Southern British Columbia Coast Mountains Coulter, Brittany (University of Victoria)</p> <p>It has become increasingly clear that the rapid melting of mountain glaciers around the globe is climatically-driven, and that our current understanding of how this will influence British Columbia's water resources, hydroelectric power planning, climate change adaptation strategies and natural hazard assessments is incomplete. Long-term monitoring and an increased historical understanding of glacial activity will add an appreciation of the glaciological response to climate changes. Dendroglaciological investigations were conducted on the proglacial landscape of Camp Glacier (unofficial name) in the British Columbia Coast Mountains. This high-elevation location (1488-1563 m asl) is situated above Klinaklini Glacier and is by mature montane forest comprised of mountain hemlock (<i>Tsuga mertensiana</i>) and subalpine fir (<i>Abies lasiocarpa</i>) trees. Observations by Don Munday indicate that Camp Glacier was an active tributary to Klinaklini Glacier in 1936 AD. Prior dendroglaciological investigations of the Klinaklini Glacier indicated that it was expanding and advancing downvalley at 3.78, 3.69, 3.48, 1.44, 1.0, 0.83, 0.63 and 0.45 ka BP. The proglacial area at Camp Glacier has been exposed within the last 80 years by frontal retreat</p>

	<p>and downwasting. Dendroglaciological investigations describe a mid-Holocene glacial advance into a mature montane forest prior to 6350 years BP. Following this, Camp Glacier continued to expand down valley from an adjacent icefield toward Klinaklini Glacier from 6.44 to 5.66 ka BP. This advance is consistent in timing with other mid-Holocene phases of positive mass balance at 7.40 – 5.99 and 5.99 - 5.05 ka BP. The research facilitates a broader understanding of mid-Holocene glacier activity in the southern British Columbia Coast Mountains and contributes toward understanding long-term glaciological responses to climate changes in this setting.</p>
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