# 12th Annual UNBC Graduate Conference

## CONFERENCE ABSTRACTS 2017

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

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UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

NBCGSS

## 1: HEALTH AND WELLNESS

*Location: NUSC Event Space*

### 1/1

**Narrative Influences on Northern BC Women's Experiences of Caring for a Spouse with Dementia**

Karen Koning

The purpose of this study is to explore the ways in which older women perceive and cope with caring for a spouse with dementia through the lens of their life stories. As the disease progresses, the caregiving spouse takes on an increasing number of caregiving tasks as well as household tasks that used to be completed by the spouse with dementia.

The study builds on previous research in Reminiscence Therapy, Narrative therapy, and Narrative Gerontology to investigate how dementia caregivers engage with their personal stories in relation to their role as caregivers. This study uses a qualitative approach to explore the role of reminiscence for older female caregivers. Criterion and snowball sampling are being used to recruit older women (65 and older) who are caring for a spouse with dementia. Participants are engaged in semi-structured interviews during which connections between their life stories and their role as caregivers are explored.

Preliminary results provide insight into the ways in which reminiscence influences the daily lives of caregivers. Participants have shared both positive and negative caregiving experiences as well as memories that are significant to their role as caregivers. Once complete, it is expected that this study will provide valuable information for social workers and other professionals practicing with dementia caregivers. It is hoped that this research will help practitioners better understand how caregivers cope and better support caregivers who are struggling.

### 1/2

**Quality of life for young women with type 1 diabetes**

Heather Thomas

This paper presentation will discuss the results of a literature review for the thesis project "The Impact of Yoga on the Quality of Life for Young Women with Type 1 Diabetes: A Qualitative Study". The focus of the presentation will be on the impact of Type 1 diabetes on quality of life for young women (ages 19-25). Scholarly definitions and dimensions of quality of life will be reviewed and considered in their relationship to the challenges associated with living with Type 1 diabetes. Special attention will be given to Felce and Perry's (1995) paper *Quality of life: Its definition and measurement*. Quality of life related challenges for young women with Type 1 diabetes to be discussed will include an higher than average mortality rate, health complications due to type 1 diabetes, impacts on mental health and wellbeing, complications around effective illness management, transitioning between paediatric to adult care, financial considerations of living with type 1 diabetes and gender specific issues. The presentation will conclude with a reflection on the implications of this information for next steps in the literature review and research process of the thesis project.

References:

Felce and Perry (1995). Quality of life: Its definition and measurement. *Research in Developmental Disabilities.* 16(1): 51-74.

## 2: SOIL STRUCTURE AND CONTAMINATION

*Location: Room 6-305*

**2/1**

**From sand dunes to forests: what is happening to the phosphorous in a hypermaritime chronosequence?**

Lee-Ann Nelson

Long-term soil chronosequences are used to understand ecosystem succession, nutrient cycling and soil development through space-time substitution. This approach has been central to studies of ecosystem retrogression - the pronounced decline in primary productivity that accompanies soil aging in diverse environments. Ecosystem retrogression has large implications for soil phosphorus (P) forms, plant diversity, litter quality, and plant nutrient acquisition strategies. In this study, a newly identified chronosequence on Calvert Island, British Columbia, Canada spanning 11,000 years was used to examine soil development and P transformations with age. This is the longest duration chronosequence documented on the British Columbia coast, and retrogression may be occurring in its oldest stages. This chronosequence is located in a humid, temperate rainforest environment, and consists of a series of coastal sand dunes. Visual examination of these dunes indicates progressive soil development and podzolization with increasing age. We will be presenting data from samples collected in spring 2016; including total P, organic P and Mehlich P results. Total P concentrations to 1 m depth decline considerably over the 11,000 years. Available P also declines with increasing age; however, the trend of decline is dependent on the soil horizon sampled. Organic P results determined from nuclear magnetic resonance spectroscopy illustrate the dynamics of organic P forms with increasing age in the forest floor and humic enriched organic and mineral horizons.

**2/2**

**Biosurfactant treatment of drill cuttings and petroleum-contaminated soil: Its role in environmental sustainability**

Ibukun Olasanmi

Environmental pollution is and continues to be an ongoing concern. Two waste streams identified as major sources of environmental pollution are drill cuttings and petroleum-contaminated soils. With public awareness on the rise, and as firmer environmental legislations are being passed, there is more focus on the need to develop innovative ways to tackle the problem. Biological methods such as bioremediation have been used for cleaning up of petroleum hydrocarbon contaminated sites. The effectiveness of microbial biodegradation is however, limited by low bioavailability of hydrocarbons to microorganisms. Thus, biosurfactants are used to improve efficiency of bioremediation by enhancing the accessibility of contaminants to microorganisms. The discuss around biosurfactants as environment-friendly and biocompatible alternatives also extends to the role they could potentially play in environmental sustainability through its application in waste reduction, potential reuse of treated waste and the use of renewable by-products as production substrates. The first part of this project involves biosurfactant treatment of drill cuttings and petroleum-contaminated soil to determine optimum treatment conditions. The experimental results indicate that the biosurfactant tested enhanced the reduction of hydrocarbons in the samples. Treatment conditions were observed to be sample-specific, and this will potentially impact recommendations made for waste treatment and disposal. The ultimate objective of this project is to contribute to research on the possibility of practicable and safe re-use of treated samples in various applications.

## 2: LITERATURE AND MEDIA

*Location: NUSC Event Space*

**3A/1**

**Creative Responses to Gendered Violence: Charlotte Mew's "A White Night" as a Counter Narrative Against Patriarchy**

Trina Johnson

The numerous representations of sexual and gendered violence found in many Victorian Gothic narratives spurred New Women writers to adapt their own narratives into tools that could counter patriarchy by exposing the passive roots of the violence directed at women in Victorian society. Charlotte Mew's A White Night appropriates the Gothic lens to give voice to the suffering of women. At the end of the Victorian Era, these women found themselves ridiculed for attempting to obtain freedoms in society. Mew exposes the feelings of oppression among women using a distinct masculine narrative and the voyeuristic nature of the masculine gaze which illuminates the oppressive care of women in a patriarchal society. Texts written by New Woman authors, such as Mew, discuss gendered violence from a different perspective than that of male authors. Many male authors of the Victorian era created narratives that expose their fears of "The New Woman" who represented women who were intent on gaining "The Vote", the right to be educated equally, and the right to independence. New Women writers employed various methods to challenge social norms of their society to gain greater agency and change the anger directed at women into understanding and respect. The gothic setting and tone of Mew's story "A White Night" creates a shocking and clear representation of how patriarchy becomes a blind eye and a deaf ear to the experience of women and effectively buries their cry for equality and freedom beneath the solid stones of patriarchal righteousness.

**3A/2**

**The mundane gothic in Northanger Abbey**

Alexandra Wagstaffe

This paper will examine the idea of the "mundane" Gothic in Jane Austen's novel *Northanger Abbey*. The difference between the "mundane" Gothic and "true" Gothic is that while the "true" Gothic belongs to the realm of the fantastic, the "mundane" Gothic is less drama and adventure-filled than "true" Gothic, but is more realistic. My thesis is that the "mundane" Gothic points out the terrors and horrors of Austen's society as well as highlighting the heroic and villainous characteristics in the everyday person. I will address the "mundane" Gothic by examining Austen's *Northanger Abbey* and comparing it to Ann Radcliffe's work, Radcliffe being a famous Gothic authoress of the time. I will compare the "mundane" Gothic to the "true" Gothic by comparison of the heroine Catherine Morland to Adeline from Radcliffe's *The Romance of the Forest*, the hero Henry Tilney to Theodore from *The Romance of the Forest*, and lastly, a comparison of both villains John Thorpe and General Tilney to Montoni from *The Mysteries of Udolpho*. Through these comparisons, I hope to prove that Austen's society was full of everyday, normal horrors and terrors that Catherine Morland, through her flights of fancy, failed to see throughout the novel because she was too obsessed with fantastical ideas of the Gothic to take note of them. This paper's examination of the "mundane Gothic" will bring a new term to the field of Romantic literature, for although the idea of the ordinary and mundane has been examined in *Northanger Abbey*, it has yet to be defined as such.

**3A/3**

**Bella's Devastating Desire**

Devyn Flesher

The "Twilight Saga" is one of the most successful pop-culture franchises of the new millennium. It is adored by millions of screaming fans and continues to be criticized by scholars and parents years after the release of the final film. In this excerpt from my Masters Thesis, titled "Negotiating the Conditions of Bella's Desire: Gender and Sexuality in the *Twilight* Saga," I delineate the ways in which Bella Swan represents a deviant and abject threat to the Cullen family. Edward and his family display a careful and precarious control over their blood lust and therefor their sexual impulses. Bella lacks appropriate control over her sexuality, which threatens Edward's control and ultimately makes her the only true threat to the safety and security of Edward and his family. Bella's deviance leads to her ultimate containment, through marriage, and punishment via a monstrous pregnancy and birth, that uses horror movie tropes to codify her – and by extension female sexual desire – as horrific. The chapter

grounds the ideology of “Twilight” in contemporary discourse about rape culture and toxic masculinity and connects to historical pop-culture representations of “supernatural” relationships.

**3A/4**

**Indigenous peoples’ in the media: Perpetuating indigenous health disparities with pathologizing discourses**

Melissa Johnson

Discursively constructed from first contact, Indigenous peoples have continued to be framed in terms of the Other in both federal law and mainstream media. In Canada, print news media have received surprisingly little scholarly study in regards to their representation of Indigenous peoples. Employing a Foucauldian discourse analysis, I intend to explore pathologizing constructions of Indigenous peoples in national and provincial newspapers. I argue that persistent and pervasive stories of "sick Indigenous bodies" produces a narrative environment that might influence non-Indigenous perceptions of Indigenous identities and perpetuate the ill-health of Indigenous peoples in Canada. As such, this research further extends existing conversations about social determinants of health by incorporating discourse as an active player in the construction of Indigenous subjects. Ultimately, my intention is to unsettle the discoursing about Indigenous peoples in Canadian popular media, narratives that I hypothesize are actively lived by Indigenous peoples and manifest in health inequities. Situated within the TRC's (2015) recent call on all Canadians to “share responsibility for establishing and maintaining mutually respectful relationships,” this research encourages an examination of the discursive relationship between Indigenous and non-Indigenous peoples.

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## 3 B: TECHNOLOGIES IN RADIATION AND GENE SPLICING

*Location: Room 6-305*

**3B/1**

**Speckle pattern based single pixel imaging with terahertz radiation**

Patrick Kilcullen

Single pixel cameras have emerged as a promising architecture for imaging far outside of the spectral range of conventional digital cameras. In single pixel imaging, a multi-pixel light sensor is exchanged for a single robust ‘bucket’ sensor which is used to optically compute linear samples of an object placed at the imaging plane. Although various applications of the single pixel technique for imaging in the terahertz (THz) region have been presented in the literature, current systems remain limited in terms of cost, complexity, and speed. An upcoming thesis by the presenting author has proposed a new modality for THz single pixel imaging which takes advantage of compressive sensing techniques and random speckle patterns. This proposed modality offers a new trade-off in complexity and speed in comparison to current imaging systems with the introduction of a spatial light modulator that is minimally simple and inexpensive. Experimental results of this new technique will be presented for the first time, in addition to a discussion of applications for real-time THz imaging.

**3B/2**

**Nuclear reactions measured using DRAGON**

William Huang

A new gamma array for DRAGON is being studied. DRAGON is a facility that measures the rates of nuclear reactions that take place in the stars. Rates of nuclear reactions like (p, gamma) and (alpha, gamma) on radioactive nuclei can be measured using TRIUMF's radioactive ion beams facility ISAC and DRAGON. An essential component of DRAGON is an array of 32 scintillation gamma detectors. The current array is composed of BGO (Bi4Ge3O12) organic scintillators. BGO, was suitable for DRAGON at the time of its design 17 years ago because it had the best properties (energy resolution and efficiency) for the price of about $2 million. A major disadvantage of BGO is that it is a very slow scintillator. Current DRAGON experiments require scintillators that are faster than BGO and have higher resolution and efficiency. LaBr3 (Lanthanum Bromide) seems to fit these requirements. Given the high cost (as high as the cost of BGO) we need to study the properties of LaBr3 very carefully before we go ahead and request funds to replace the BGO array with LaBr3. The study is designed to be done in three steps:

Step1: On the bench measurements of efficiency, energy resolution, and timing properties.

Step2: Simulate LaBr3 properties using the GEANT software simulation package.

Step3: Carry out full experiments of the (p, gamma) type using small number of LaBr3 detectors to observe their performance under realistic experimental conditions.

The LaBr3 detectors used in this project are borrowed from other experiments at TRIUMF and other laboratories.

**3B/3**

**An investigation of splicing relevance and 5` splice site recognition in Cyanidioschyzon merolae**

Fatimat Shidi

Splicing is a complex and intriguing step in the processing of precursor messenger RNA. Because it can be linked to various diseases (such as cystic fibrosis), it is important to understand this process for future therapeutic approaches. The Rader lab has proposed that *Cyanidioschyzon merolae* should be a good model to study this process. It was characterized a reduced spliceosome in *C. merolae* and confirmed that pre-mRNAs are indeed spliced. However, the relevance of splicing for biological activity has not been investigated so far. One of the main goals of my project is to investigate how essential is processing of mRNA by blocking this nuclear process. In other organisms, splicing initiates with recognition of the 5` splice site by U1 snRNA and binding of U2 snRNA to the branch point site (BPS). I hypothesize that prevention of U2 snRNA binding to the BP should block processing of mRNA. Here, I initiate this investigation treating the cells with a morpholino oligo (AMO) that binds to the U2 BP binding sequence expecting preventing of binding of U2 to the BPS. If splicing is in fact essential, the AMO should cause growth defects or death of the cells. It is also proposed to use the same method to investigate recognition of the 5`ss by U5 snRNA. Due to absence of U1 in *C. merolae*, the Rader lab proposes that U5 would be a potential candidate for recognition of the 5` ss. Therefore, I will use an AMO complementary to the 5' splice sites of essential genes and, furthermore, to U5, to address that intriguing question.

**3B/4**

**The Structure of Snu13 from C merolae: Glimpses of a Highly Reduced Spliceosome**

Corbin Black

Prior to protein synthesis, messenger RNA is transcribed from DNA and often contains sequences not included in the final transcript. The removal of those sequences and subsequent joining of coding sequences is known as pre-mRNA splicing. The process is facilitated by a ribonucleoprotein complex made up of various small nuclear RNA and associated proteins. *Cyanidioschyzon merolae* is a unicellular red alga that has fewer intronic sequences than higher eukaryotes, and expresses a largely reduced spliceosome. This presents a reduced model with which to study pre-mRNA splicing.

One of the most critical steps in the activation of the spliceosome is the interaction between U4 and U6 snRNPs. U4 formation is affected by several proteins, one of which is Snu13. Given that it is present in the reduced spliceosome of *C. merolae* and has homologues in both humans and yeast, it is likely integral to di-snRNP formation. Snu13 is a 15.5 kDa globular protein in the α-β-α fold conformation; it binds the kink-turn motif of spliceosomal U4 snRNA during U4 activation, and likely precedes several other U4 snRNP-associated proteins.

The two goals of the project were to determine the structure and the function of Snu13 in *C. merolae*. I purified recombinant CmSnu13 from bacteria and used a variety of techniques to characterize its structure and activity, including binding to an RNA substrate. This work has provided insight into the function of this protein in *C. merolae* and serves as a proof of principle for the *C. merolae* spliceosome as a relevant model.

## 4: CIF MASTERS NIGHT

*Location: NUSC Event Space*

**4/1**

**Habitat and Population Ecology of Haida Gwaii Marten.**

David Breault

Pacific marten are a coastal species of weasel native to Haida Gwaii. Pacific marten have a wider jaw than the mainland American marten, and it has been hypothesized that this is an evolutionary adaptation for crushing marine invertebrates. However, there is little evidence to suggest Pacific marten spend time foraging in the intertidal. Trap returns on the islands indicate that marten may have increased in abundance since the 1940s. This potential population growth coincides with the introduction and proliferation of many mammal species found in the diet of marten on Haida Gwaii, including Sitka black-tailed deer, black rat, muskrat, beaver, and red squirrel. Working in collaboration with my supervisor, Dr. Chris Johnson, my proposed MSc research will focus on the diet, abundance, and distribution of Pacific marten on Haida Gwaii. I will use stable isotope analysis to determine the relative contributions of prey, including introduced species and native species at risk, to marten diet across seasons. I propose to use camera trapping and hair snaring techniques to model marten abundance and distribution on the managed landscapes of Graham and Moresby Islands. This study is a key component of a larger research program designed to explore the trophic interactions of native and introduced species on Haida Gwaii currently under investigation by the BC Ministry of Forests, Lands, and Natural Resource Operations and BC Ministry of Environment, in collaboration with Parks Canada.

**4/2**

**Fibre response to temperature and precipitation variation in natural and plants stands of pine (Pinus contorta vr. latifolia) and spruce (Picea glauca x Engelmannii) in northern interior British Columbia.**

Anastasia Ivanusic

Changes in climate can affect tree-ring growth and quality of wood fibres. British Columbia produces some of the highest quality of fibre in the forest industry; higher quality wood fibre can be made into a wider variety of products. The main objective is to assess fibre quality within natural and planted stands of white spruce (*Picea glauca x Engelmannii*) to determine if climate variation is a limiting factor. Stands will be selected from Northern British Columbia forests with a focus on areas that are predicted to show climate as a limiting factor on growth. We will compare our dendrochronology assessment, the correlated data of consistent variation in tree-ring patterns and climate data, to SilviScan data, which looks at specific fibre qualities; cell types (earlywood and latewood ring width), maximum and minimum densities, microfibril angle, lumen size and radial and tangential diameter. If the fibre quality is changing with climate British Columbia's forest industry may need to change focus to different products or product manufacturing processes to account for changing fibre qualities. Fibre quality information and its' relationship with climate change is valuable for future forest ecology and silvicultural research and practices within British Columbia.

**4/3**

**Susceptibility of nestling tree swallows to parasites.**

Ilsa Griebel

As aerial insectivores are the fastest declining group of birds in Canada, it is essential to understand all aspects of their biology to maintain biodiversity. My master's research focuses on the susceptibility of nestling tree swallows to nest-dwelling ectoparasites. The tree swallow, an aerial insectivorous, secondary cavity nesting bird, is parasitized by a variety of ectoparasites, including fleas, mites and larval blow flies. Tree swallows hatch asynchronously, typically over a one to two day interval. This hatching pattern creates a mass-size hierarchy among siblings, increasing the morphological, immunological and physiological variation that occurs within broods. Thus, the parasite susceptibility of siblings is expected to also vary. In past studies, nests have been treated to create parasite-free environments, resulting in entire broods facing the same parasite environment (infested vs. parasite free). I used a broad-spectrum, anti-parasite drug, ivermectin, to experimentally manipulate the parasite susceptibility of individual nestlings, which could provide unique insight into host-parasite interactions. Preliminary results suggest treatment successfully reduced the number of blowfly pupae in a nest. During the 2016 field season, two days of harsh weather (cold temperatures

averaging 7.0°C and a total precipitation of 46 mm) resulted in the death of 49% and 86% of the broods, at my two main field sites. This provided an excellent opportunity to investigate the importance of parasite environment relative to other explanatory variables, like characteristics of the parents, nestlings, brood, and nest, in determining nestling and brood survival during harsh weather. I found that different key factors predicted survival depending on whether the brood or the individual was examined. If the frequency of extreme weather events increases with the progression of climate change, it may become critical for aerial insectivorous bird populations that we understand the key factors determining survival during harsh weather events.

**4/4**

**Comparing the functional characteristics of oxidative stress proteins between Dendroctonus ponderosae population.**

Luke Spooner

Oxidative stress proteins are a key component of the mountain pine beetle's, *Dendroctonus ponderosae*, detoxification arsenal. Although, how these proteins specifically function has not been well documented for beetles. In order to better understand their role in the detoxification process, functional characterization assays will be designed for five oxidative stress proteins (superoxide dismutase, ferritin, catalase, peroxiredoxin, and glutathione peroxidase). If protein variants, from the Alberta population of mountain pine beetle, contain nonconserved amino acid substitutions then additional assays will also be conducted for these proteins, and the results will be compared between all population specific variants. Determining the function of these proteins could provide insights into how the mountain pine beetle was able to colonize their novel jack pine hosts and contribute to predictions on the the continued spread of the mountain pine beetle into the Boreal forest. Additionally, these assays could have clinical relevance, considering these proteins are ubiquitous across phyla and vital within human systems.

**4/5**

**Using LiDAR to Meet Landscape Level Biodiversity Objectives – A Preview.**

Colin Chisholm

The Biodiversity of forests is often proposed to be integrally linked to the 3 dimensional structures inherit within each stand. Old forests are assumed to provide the highest amount of structural diversity and therefore the highest contributing value on the landscape, while the current management of biodiversity for forests is often based on measures embedded in broad landscape level plans and models (e.g. biodiversity orders and the provincial VRI). Here I examine Aerial Laser Scanning as a source of improving landscape level inventories. Focus is placed on taking inventory of forest structure to meet landscape level biodiversity objectives. Highlights of this presentation include a review of LiDAR metrics and essential digital models derived from LiDAR. Our work is being completed at the Aleza Lake Research Forest a forest that provides a high variety of natural and management forest histories, with stand management starting in the 1920s. Metrics generated as indicators for biodiversity are used to compare natural old growth and mature second growth forest stands. Specific metrics focus on the structural complexity of forest stands including measures of coarse woody debris, vertical complexity, horizontal canopy closure and gap analysis. Initial results indicate that Aerial Laser Scanning techniques are effective at detecting and characterizing relevant forest structural characteristics of stands which can then be used to inform landscape planning.

## 1A: Climate Change and Pollution

*Location: NUSC Event Space*

**1A/1**
**Climate change impacts on highway safety**
Zongfan Luo

Traffic collisions are one of the world's major problems. According to the World Health Organization (WHO), about 1.25 million people die every year in traffic collisions across the world and a further 20 - 50 million are injured or disabled. 24% of all collisions are weather-related. Collison risk usually increases from 50 to 100 percent during precipitation. Historically, collision rates, linear regression and generalized linear regression methods have been used as the basis for safety assessment. Research has shown that there are limitations with this approach due to the non-linear relationship between collision frequency and exposure. Collision prediction modeling is the recommended technique for estimating road safety in the American Association of State Highway and Transportation Officials (AASHTO) Highway Safety Manual (HSM). However, the prediction modeling does not fully take into consideration of traffic seasonal variation and weather impacts as the annual average daily traffic (AADT) is one of main variables. Previous studies indicate that weather especially winter weather is associated with the traffic collisions. Due to climate change, the frequency of extreme weather events increases and weather patterns are changing, which will affect highway safety and reliability. The study will synthesize the major findings and proposed methodologies from the existing studies. Collision risks related to weather will be investigated and assessed. Traditional techniques of highway safety assessment without the consideration of seasonal variation of traffic collisions, especially winter weather impacts in Canada, might result in underestimating the safety risk. Further study of weather impacts on highway safety with a focusing on the seasonal variation of collisions and traffic volumes will improve the highway safety assessment and provide valuable inputs for winter road maintenance. A prediction model of traffic collision seasonal variation and highway reliability due to extreme weather events and high precipitation will be developed in the study by using neuro-fuzzy approach. A decision making framework on winter maintenance strategy will be established. In conclusion, the proposed model is able to predict the traffic collision seasonal variation, to provide more accurate estimate of traffic collisions on both rural and urban highways and to help to develop winter maintenance strategy and policy.

**1A/2**
**Climate change impact on glaciers**
Adam Hawkins

Modern climate change has been identified by scientists and governments worldwide as one of most pressing issues facing society, as stated in the 2014 IPCC report. Vital to understanding how the Earth's climate will change in the future is having detailed knowledge of past climate fluctuations. Alpine glaciers respond sensitively to changes in climate by adjusting their volumes and down-valley extents. These fluctuations can leave evidence of past glacier margins in the terrestrial and lacustrine record. While a multitude of studies have sought to use past glacier activity to elucidate paleoclimate, relatively few have successfully produced robust glacier chronologies with dating errors minimal enough to allow for regional to global-scale comparisons. Significant improvements in Quaternary dating methods over the past couple decades, especially Terrestrial Cosmogenic Nuclide dating (TCN), now allow for very young samples (200-500 years old) to be numerically dated with errors of around 10% of the sample age. My proposed doctoral research aims to utilize novel applications of cosmogenic nuclide dating, in conjunction with traditional methods of glacier reconstruction, to improve our understanding of Holocene climate change at high latitudes, specifically northwestern Canada and southern South America. This work will be used to test models of regional climate sensitivity and help guide environmental protection efforts in these fragile alpine environments.

**1A/3**
**Large area glacier change for western Canada over 31 years of satellite imagery**
Alexandre Bevington

Analysis of glacier extent though time provides one method to assess the magnitude and spatial pattern of recent climate change. Previous work in western Canada used semi-automatic methods to delineated glacier extents from

Landsat imagery for the years 1985, 2000 and 2005. Over that time period rates of glacier area change averaged -0.55 % $yr^{-1}$. We build upon that work by providing post 2005 area change assessment and also increase the number of years over which glacier change is evaluated. Our workflow runs in Google Earth Engine that analyzes publically available satellite imagery [Landsat Thematic Mapper (TM), Enhanced Thematic Mapper (ETM+) and Operational Land Imager (OLI) sensors] for all available late-summer scenes between 1985-2016. Our algorithm employs a semi-automated method based on band ratios, a normalized difference snow index (NDSI) and a green band threshold. Areas of recent deglaciation are delineated and trends in glacier extents are compared to change in energy and mass flux present in climate stations and reanalysis products. We also discuss preliminary results of a 2016 western Canada glacier extent produced from Sentinel-2A Multispectral Instrument (MSI) imagery. Sentinel-2A offers a higher spatial resolution (10 m) than Landsat satellites (15-30 m). Validation and uncertainty estimates are conducted using air photos, LiDAR and high resolution satellite imagery for different environmental settings. Debris-covered glacier ice still presents a challenge to this mapping and is only manually corrected for the 2016 Sentinel-2 glacier inventory.

**1A/4**

**High-performance prefabrication for BC's North**

Maik Gehloff

Wood construction has a long history in BC, particularly in residential construction, but also in light commercial construction. These types of buildings are largely built using traditional wood frame construction and in the case of commercial buildings, tilt-up concrete. Both of these types of construction rely largely on on-site fabrication, making them susceptible to inclement weather conditions, which leaves them at risk for delays and budget over runs. These risks are further heightened in northern and remote communities due to a dramatically shortened construction period and limited access to construction materials that often need to be shipped in from far distances. The use of pre-fabrication and other new technologies provides unique opportunities for northern and remote communities where construction periods are often short and distances are large. Structures could be pre-fabricated and shipped to site be assembled in days rather than months as is common for on-site construction. Pre-fabrication requires detailed planning right down to the location of electrical outlets and light switches. The need for pre-planning can be an advantage as a building's performance can be optimized for its location. The need for planning would also allow implementing tools like Building Information Modeling (BIM) and Fabrication Information Modeling (FIM). One of the benefits of these type tools is being able to fabricate these structures on various different equipment and facilities' as well as being able to maintain detailed product maintenance and replacement information through the BIM framework.

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## 1 B: SOCIAL AND HEALTH RESEARCH

*Location: Room 6-305*

**1B/1**

**Syrian refugee resettlement through private sponsorship: A case study in Northern BC**

Stacey Pickering

In 2015, nearly 65.3 million people were forcibly displaced across the globe, including approximately 11.7 million people from Syria, a nation particularly affected by intensifying conflict. This humanitarian crisis prompted the UNHCR to call on governments worldwide to provide long-lasting solutions for Syrian refugees. In response, Canada committed to resettle 25,000 Syrian refugees by early 2016. While this process is still ongoing, since November 2015, over 40,000 Syrian refugees have arrived in 350 communities across Canada and nearly half of them are privately sponsored. This context has stimulated international interest in Canada's Private Sponsorship of Refugees Program (PSPR) and offers a unique opportunity for research. My graduate research is a case study focused on the experiences of Syrian refugee sponsors in small and mid-sized communities in northern BC. My aim in this regional setting is to: (1) examine how the PSRP is being enacted to provide humanitarian relief to Syrian refugees; (2) explore the resources needed to provide financial and social support during sponsorship; and

(3) detail resettlement outcomes after one year of sponsorship. Through extended engagement with sponsors, I hope to generate new knowledge on how best to encourage private refugee sponsorship in countries interested in learning from the PSRP, as well as develop best practices for its delivery in a range of geographical settings. This presentation provides an overview of Syrian refugee resettlement efforts in Canada, particularly through private sponsorship, as well as a discussion of my thesis research design and methodology.

**1B/2**

**Full parental understanding of a child's diagnosis of a developmental disability**

Tammy Stubley

Full parental understanding of a child's diagnosis of a developmental disability is critical to be able to ensure the best health outcome for their child. Yet factors that parents perceive as influencing their comprehension during the final diagnostic meeting have not been well identified. As part of a qualitative study using interpretive description, 17 parents were interviewed on the basis of their having been referred to, and for having received a child's developmental diagnosis from a Complex Developmental Behavioural multidisciplinary team located in northern British Columbia. Semi-structured interviews focused on the factors that played a role in facilitating or impeding the parents' understanding of their child's diagnosis, and on the identification of factors that influenced the way in which the child's clinical recommendations were pursued. The interviews were recorded and transcribed. Data analysis was informed by Braun and Clarke's six phases of thematic analysis.

Three overarching themes with twelve subthemes emerged from parents' reported experiences of receiving their child's developmental diagnosis. The three overarching themes and twelve subthemes included (a) clinical encounter (including the subthemes structural considerations, professional diversity and new insights, questions regarding the assessment process, validation, and expectations); (b) the manner of the delivery of the diagnosis (impact—emotional and impact on parenting practices, professionalism, professional language, and quantity of information); (c) Where do we go from here? (post disclosure, the final evaluation report, and recommendations). The parents' accounts established and clarified the positive and negative parental determinants that aided or challenged their ability to understand their child's developmental diagnosis and identified the influence this had when it came to implementing the clinical recommendations. **Conclusions:** Parents reported several factors played a role in facilitating or impeding their ability to comprehend their child's diagnosis. The risks and benefits associated with the child's recommendations extend beyond the medical exchange that occurred at the family disclosure meeting. The parents' narratives provided insight into a complex phenomenon.

**1B/3**

**Administrative Data in Health Research: Flexibility and Creativity in Answering Research Questions**

Alex Fraess-Phillips

Organizations across Canada are constantly collecting data. In many cases, these data are not collected for research purposes. Rather, they are collected for administrative purposes: patient medical records to provide and monitor care; birth, death, and marriage certificates used for vital statistics; election registers for voting eligibility; census data for policy planning; and even postal code data for determining mail delivery. Given that these data are not collected for research purposes, many researchers overlook their potential in answering complex social and health research questions. These data are often collected over a period of many years, cover many demographics, and span many geographical and political jurisdictions, serving as a plentiful source of diverse and readily available data. By accessing the appropriate administrative datasets, a researcher can complete a study in a matter of weeks rather than spending multiple years (or even generations) collecting their own data. However, these administrative datasets are not without their challenges. This presentation will outline some of the challenges associated with administrative data use and how researchers must use creative thinking to create meaningful variables from data not intended for research purposes. Examples of challenges faced and overcome by researchers using administrative data in the literature will be provided, as well as examples of challenges faced planning my own administrative data research regarding non-urgent emergency department use.

**1B/4**

**Sharing the self: applications of devised theatre and narrative practices in health and wellness initiatives**

Nicole Schafenacker

Arts-based approaches are increasingly being recognized as means for addressing the human dimension of care in patient/client experiences. Devised theatre and narrative practices offer a potent means of accessing ways of knowing and can act as tools for cultivating resiliency. The creation of rich and evocative image-based narrative that

lives in the body can serve public health as a tool for empowering the individual and the means to develop a voice with which to advocate for the self. Research questions which have guided my inquiries include: 1) Can we access the lived experience and through writing or performance in order to connect with wellness?; 2) Additionally, can we use the body and intuition as source of knowledge to develop this creative material?; 3) Can narrative writing/performance be a tool for diminishing barriers between patients and their health care providers?; 4) What arises when we a) share this knowledge in the context of a focus group and b) share it with an audience in a public setting? Schafenacker will share examples of projects in which devised theatre and narrative practice have been employed to access a participant's lived experience and have served as a means to engage in advocating for change, cultivating empathy, healing the self and others, and clarifying value commitments.

## DAY 2 SESSION 2:
## Friday March 24, 2017

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### 2: PANEL DISCUSSION

*Location: NUSC Event Space*

**Leading-edge Research Methods within Environmental Studies**

**Development of eDNA monitoring tools and protocols for assessment of Western painted turtles (Chrysemys picta bellii) in British Columbia**
Mandi Baxter

**Habitat and Population Ecology of Haida Gwaii Marten.**
David Breault

**Susceptibility of nestling tree swallows to parasites**
Ilsa Griebel

**Comparing the functional characteristics of oxidative stress proteins between Dendroctonus ponderosae population**
Luke Spooner

**Monitoring the Mt. Polley tailings breach; trace metals bioavailability in surface waters, biofilm, and insects of the Quesnel Basin, BC**
Aaron Zwiebel

The structure of science is ever evolving as new techniques enable new ways of discovery. As graduate student researchers, we are gratified to be using and developing innovative techniques in Natural Resources and Environmental Studies. Diffusive Gradients in Thin Films is a time-integrated, in-situ method that quantifies the concentration of elements and chemicals in aqueous solution. It presents many advantages over traditional water quality monitoring, particularly pertaining to bio-available compounds. Environmental DNA (eDNA) monitoring uses DNA-based identification to detect species from residual genetic material left behind in the environment. eDNA sampling is non-invasive and has great potential for detecting rare species. Stable isotope analysis has emerged as a powerful tool in quantifying animal diets. The signature ratio of heavy:light nitrogen isotopes reflects the animal's trophic position, while the carbon signature can be used to determine what constitutes the animal's diet. Recently, ivermectin has been employed to manipulate the parasite load of birds, enabling researchers to identify cause-effect relationships in a way observational research cannot. Endoscopy can be used to assess the natural burdens of nematode parasites and the effectiveness of an ivermectin treatment. New protein assays are being developed to characterize oxidative stress proteins of beetles. Determining the function of these proteins could prove highly useful in determining the continued spread of the mountain pine beetle into the Boreal. These techniques have advantages over traditional methods and widespread use could improve the efficacy of environmental and species monitoring in Canada.

## 3A: ECOSYSTEM HEALTH

*NUSC Event Space*

### 3A/1
**Shale gas development and forest change in northeastern BC**

Joseph Oduro Appiah

My research investigates forest cover change/fragmentation in relation with shale gas drilling in Northeastern BC using Landsat land cover data for the years 1975, 1985, 1995, 2005 and 2015. The research characterises the pattern and trends of change and fragmentation, taking into account which shale gas infrastructure (shale gas well pads, shale gas pipelines and roads) is/are causing more change and fragmentation of the forest cover. Remote Sensing (RM), Geographic Information Systems (GIS) and landscape analytical programs are being used in my research for data preprocessing, processing and analysis. United States Geological Survey (USGS) and BC Oil and Gas Commission are the main sources of data for the research. Datasets such as roads, pipelines and shale gas well pads are being used in the ongoing research. The output of this evidence-based research would enable policy makers to decide if more rigorous measures are needed to protect the forest resources as society quests to benefit from shale gas development economically.

### 3A/2
**Elemental sulfur amendment decreases bioavailable Cr-VI in soils impacted by leather tanneries**

Jingjing Shi

The long-term disposal of waste has contributed to the accumulation of chromium (Cr) in soils around leather tanneries in Shuitou (China). Among Cr species, Cr-VI is a particular concern due to its high mobility and carcinogenic property. This study investigated the potential use of elemental sulfur ($S^0$) served as an electron donor to convert Cr-VI to Cr-III which should decrease the bioavailability hence, toxicity of Cr-VI in soils. X-ray absorption near-edge structures (XANES) spectroscopy was used to analyze the speciation of Cr in soils before and after 2 mg $g^{-1}$ $s^0$ additions. Synchrotron-based X-ray fluorescence (XRF) and X-ray diffraction (XRD) techniques provided the storage of Cr in Fe-rich solids. Bio-available Cr-VI was estimated by phosphate buffer extraction (PBE), simulated synthetic precipitation (SPLP) and distilled water extraction. Results show that Cr-III was the dominant species (99% of total Cr) in soil from the Shuitou region and Cr was significantly associated with Fe in the spatial distribution. Micro-XRD results indicated that hematite and goethite were the Fe minerals that retained Cr. The bio-available fraction extracted by PBE was ~10% of the total Cr-VI and varied from12.8 to 42.5 mg $kg^{-1}$ in soil samples. With the application of 4.0 mg $g^{-1}$ $s^0$, the PBE Cr-VI decreased to < 0.4 mg $kg^{-1}$ limit established for Cr-VI toxicity in soils. It is concluded that $S^0$ amendment is a promising approach to remediate Cr-VI contaminated soils.

### 3A/3
**The impacts of the ecosystem services paradigm on protected areas' practices and conservation goals**

Fabricio Matheus

The primary objective of this research is to provide an empirical assessment of the impacts of the latest conservation paradigm on protected areas. This new paradigm can be identified by an increased role of market-based mechanisms, exemplified by the concept of ecosystem services brought forward by global conservation agencies, specific branches of science and economists (Büsher et al., 2012). While there is a critical debate about this new approach, focusing on what authors call neoliberal conservation (Castree, 2006; Igoe & Brockington, 2007; Büsher et al., 2012), few empirical studies explicitly examining its impacts on protected areas and their conservation goals exist (Clements & Milner-Gulland, 2015; Holmes & Cavanagh, 2016). Protected areas have long been one of the main international strategies for biodiversity conservation (Dudely, 2008). However, the market-based approaches that are increasingly influencing and changing PA management goals and practices can create environmental and social problems. Therefore, as suggested by Bakker (2009), the proposed research focuses on a comparative empirical study that explores a wide range of liberal strategies applied to a specific resource type, represented in this case by protected areas. Such a comparative case study of neoliberalism's impacts on protected areas will provide a historical and contemporary analysis of how this new paradigm emerged in different places. This research applies a social constructionist approach to nature, conservation, and

PAs, in order to help unveil the different meanings and discourses within the paradigm.

**3A/4**
**Modeling atmospheric pollution and deposition on the northwest coast of British Columbia**
Chibuike Onwukwe

Within the Terrace-Kitimat Valley area on the northwest coast of British Columbia, new resource development projects such as liquefied natural gas processing, bitumen refining and shipment of refined fuels are expected to create jobs and boost government revenues. These ventures are also likely to have significant environmental impacts, particularly on air quality. Unless the study of airborne substances is based on the considerations of time and space-varying emissions, and the non-linear effects of multiple pollutants, it will be difficult to draw definite conclusions on local atmospheric response to contaminant releases, let alone projecting their deposition on environmental receptors. Hence, my research proposes to study the cumulative effects of increased emissions of multiple pollutants from various sources on air quality in the Terrace-Kitimat Valley Airshed. It will model the deposition of sulphur and nitrogen as well as ambient concentrations of precursor pollutants using a photochemical model. It will investigate meteorological and local site conditions that are associated with relatively higher levels of atmospheric pollutants and deposition. Also, measures for sustaining good air quality in this geographical entity will be discussed. To the extent that the proposed study seeks several lines of evidence, including records from meteorological and air quality monitoring stations, pollutant emissions inventories and outputs of an air quality model, signifies a comprehensive approach in understanding the nature of air pollution in rugged, coastal terrain settings.

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## 3 B: BUSINESS RESEARCH

*Location: Room 6-305*

**3B/1**
**Uncertain Promotions: A Consumer Motivational Perspective**
Umair Tahir

The needs for safety and security as well as growth and advancement are the basic, fundamental human needs that influence our motivation in every aspect of life (Maslow, 1943, 1954). Research in the past few decades on self-regulatory focus has shown that the salience of fundamental need for growth over the fundamental need for security (and vice versa) can influence motivation, judgment, decision process and behavior (for a review, see Boesen-Mariani, Gomez, & Gavard-Perret, 2010; Higgins, 2015). In particular, the regulatory focus theory (Higgins, 1997), a theory of motivation, categorizes two motivational systems: a promotion focused motivation that is derived by the need for growth and advancement and a prevention focused motivation that is derived from the need for safety and security. This research examines how the regulatory focus orientations of consumers influence their behavior in the context of uncertain price promotions.

Consumers encounter uncertainty in retail promotions on a daily basis. Recent examples include Tim Horton's "Roll Up The Rim" and Canadian Tire's "Scratch & Win." A critical feature of such promotions that distinguishes them from other types of retail promotions is uncertainty; that is, an actual reward is determined by chance, and usually consumers are uncertain about the possible outcome. There have been no empirical investigations on how consumers' motivational orientations influence the effectiveness of uncertain promotions. The present research aims to address this gap in the literature. In this research, the author investigates whether, and to what extent, consumers' heterogeneity influences their response to uncertain monetary promotions.

**3B/2**
**Impact of cellphones on dining experience**
Rheza Akbari

The service industry has evolved towards experience immersion, representing a viable strategy for long-term sustainability of food service – one of the top five industries providing the highest employment across Canada. This topic is explored from two perspectives, (1) the context of ethnically-themed restaurant operations, and (2) cognition as related to the attention of diners to aspects of their restaurant experience and effects of distraction on these attentional processes. This study investigates whether distraction by personal electronic devices (PEDs) reduces diners' attention to their experience.

The hypothesis was tested across two interrelated studies. Study One is comprised of qualitative work to

develop a bank of questionnaire items that assess the range of content and a scaling model for the dependent variables assessing diners' attention. Study Two investigates the dimensionality of the items comprising the dependent measures. Results suggest that, rather than a distraction, PED usage might enhance diners' sensory immersive experience.

**3B/3**

**Employee acculturation in diverse organizational environments**

Muhammad Irfan

I am interested in investigating the phenomenon of 'acculturation' in organizational context. Acculturation happens when individual and groups from different cultures come into first hand contact with subsequent psychological changes that occur. Human resources management practices have evolved throughout from industrial revolution of late 19th/early 20th century to the introduction of contemporary structuration theories. Our world has gone through many changes in this time. Different factors including wars, humanitarian crises, mass migrations, technological advancement, cooperation in international trade and interdependence of capital and labor abundant economies, jointly formulated an international business scenario in which managers must think global and act local. Therefore, it is becoming increasingly important to pay attention to the acculturation and related issues in cross cultural interaction and its effective management. My research revolves around the central question "how acculturation takes place in organizations". For this study, I will consider widely used Berry's (1980) fourfold acculturation model. Furthermore, system theory states that individual behavior cannot be adequately studied without considering contextual factors. While fourfold acculturation model reveals four acculturation orientation that individuals may adapt in acculturation process. For contextual factors, I am focusing on one of the six organizational culture dimensions identified by Hofstede et al., (1990), "tight vs loose controlled organizational culture".

Many firms employ scholarly researchers related to cross cultural issues when tapping into international markets and to effectively manage the diversity within their human resource believe this study will be a valuable addition in the nomological network of the growing area of organizational acculturation.