

UNBC Research Week

Monday, February 28th, 2022

10:00am–11:00am

UNBC Welcome and Opening Remarks

Dr. Geoff Payne, Interim President & Vice Chancellor

Lheidli T'enneh First Nation Welcome

Elder Edie Frederick

Keynote Speech: “Research Matters”

Dr. Kathy Lewis, Acting Vice President Research and Innovation

The opportunity to engage in research has been incredibly personally rewarding. I have been to many beautiful and unique places, and have had the privilege of working with many colleagues, undergraduate and graduate students, all of whom have constantly challenged how I think about research and why it matters. In this presentation I will provide some thoughts on what I have learned since embarking on my academic journey, and especially in the past two years as Acting VP. This will include some thoughts on our responsibility to be advocates, the critical importance of partnerships, the needed shift towards co-creation of research projects, the connections between research and education, and the needed paradigm shift in the definition of scholarly outputs.

Zoom link:

<https://unbc.zoom.us/j/63535899556?pwd=M3FPWm1qYnpka3NCTW5HSzZlaWtjUT09>

Passcode: 300883

11:00am–12:00pm

Presentations – Pandemic stories, Nechako River hydrology, hydropeaking, and Sustainable Development Goals

Zoom link:

<https://unbc.zoom.us/j/65948452406?pwd=K3AxRzYyMUUvTVNES09BcFIVM0d5dz09>

Passcode: 138213

Birthing in a Pandemic: Why Stories Matter

Donna Andrews, MSW student, Social Work

COVID-19 has thrown much of the world into chaos since winter and spring 2020. While the entire population is feeling the effects of COVID-19, groups like pregnant and birthing individuals who rely heavily on community systems and resources as well as social supports may be more heavily impacted. This research outlines an exploratory qualitative study which will explore the experiences of individuals who have given birth in Prince George, British Columbia during the COVID-19 pandemic. While stories are pouring out from every corner of the globe, Prince George's unique experience as a smaller Northern Community can give us great insight into how we come together to support our own in times of increased divide. Reflecting on the experiences of those in our community is incredibly important for

ensuring that we can learn from our mistakes, bolster our strengths, and be better prepared for any disaster which might come our way in the future. This presentation aims to discuss the importance of sharing these stories to normalize experiences and build community where it is needed most.

Impacts of climate change and anthropogenic activities on the hydrology of the Nechako River Basin

Dr. Rajantra Lilhare, Postdoctoral Fellow, Department of Geography, Earth and Environmental Sciences

In this study, we simulate hydrological processes over the Nechako River Basin (NRB) for 1950–2019 using the Variable Infiltration Capacity model (version 5.0.1) (VIC5 hereafter) and European Centre for Medium-Range Weather Forecasts (ECMWF) Re-Analysis (ERA)5-Land forcing datasets at high spatial (~5 km) and temporal resolutions. We applied VIC5 over the entire NRB for 1950–2019 after model calibration and evaluation over unregulated sub-basins (i.e., Stuart and Nautley). Moreover, we have incorporated the upper Nechako (Nechako Reservoir) in calibration and validation processes under naturalized flow conditions. Preliminary results exhibit overall increasing trends (not significant) in annual water balance components (i.e., evapotranspiration, surface runoff and baseflow) due to warmer and wetter climatic conditions across the Nechako Reservoir for 1981–2019. Reservoir lake ice coverage shows a significant decrease (> 50%) over 1950-2019. Further, sensitivity simulations (1981-2019), in which we alter landcover inputs (grasslands replacing forests) reveal overall increasing trends in annual surface runoff and baseflow whereas decreasing trends in evapotranspiration.

Outcomes from this research will provide crucial information on the potential impacts of land cover changes and wildfires on the hydrology of western Canada and similar hydro-climatic regimes. Additionally, this research will also benefit our industrial partner Rio Tinto with planning and management of future infrastructure development and flow regulation within the watershed as anticipated future warming necessitate an increased focus on the safety of existing dam structures.

Vanishing weekly hydropeaking cycles in American and Canadian rivers

Dr. Stephen Dery, Professor, Department of Geography, Earth and Environmental Sciences

Sub-daily and weekly streamflow cycles termed ‘hydropeaking’ are common features in regulated rivers across the globe. Weekly periodicity in flows arises from fluctuating hydropower demand and production tied to socioeconomic activity, typically with higher consumption during weekdays followed by reductions on weekends. In this presentation, we will introduce a novel weekly hydropeaking index to quantify the intensity and prevalence of weekly hydropeaking cycles at 500 sites across the United States of America (USA) and Canada over 1920-2019. Our results reveal a robust weekly hydropeaking signal exists at 1.8% of available sites starting in 1920 with a fraction that peaks at 18.9% of sites in 1963. Highly hydropeaking signals then diminish to only 3.1% of available sites in 2019, marking a 21st century declining pattern in hydropeaking intensity across parts of North America. Application of the Mann-Kendall Test reveals 138 locally significant declines in weekly hydropeaking intensity between 1980-2019. Our results can be attributed to diminishing differences between streamflow on weekends versus weekdays in regulated rivers across Canada and the USA. We will conclude the presentation with a discussion on the implications of these results on river ecosystems.

Exploring Cross-sectoral Implications of the Sustainable Development Goals: Towards a Framework for Integrating Health Equity Perspectives with the Land-Water-Energy Nexus

Christiana Onabola, PhD Candidate, Health Sciences

A mapping review was conducted to assess existing evidence and identify gaps in the integrative framework of the Sustainable Development Goals for their potential to advance cross-sectoral perspectives and actions that connect health equity with the land-water-energy nexus in a watershed context. Five (5) bibliographic databases were searched from 2016 to 2021 to arrive at an initial 226 publications, which were screened for titles, abstracts, and full texts on DistillerSR; resulting in a final 30 publications that were studied. Quality appraisal and extraction of relevant information were carried using Excel. Thematic syntheses of debates and gaps point to the relevance of the SDGs as a cross-sectoral, integrative platform for place-based programming of the land-water-energy nexus, and to account for negative externalities and cascaded impacts on human and environmental health. For the purpose of monitoring health equity in the contexts of interactions of land, water and energy in rural, remote and Indigenous contexts, and on the basis of the SDGs, this paper generates evidence to inform health equity-oriented policies, programs and practices, and to enhance health for equity-seeking populations.

12:00pm–12:15pm Break

12:15pm–1:15pm

Poster Presentations

Zoom link:

<https://unbc.zoom.us/j/68276457816?pwd=ZUITWklkaGpuVkhqdGIPQTh4TDJ5QT09>

Passcode: 686282

Sahtu Dene and Metis Community Engagement in the Closure and Reclamation of the Norman Wells Oilfield and Pipeline

Ann King, MA Student, Natural Resources and Environmental Studies – Geography

In 1921, petroleum company Imperial Oil began extracting oil from a remote region of the Northwest Territories, in an area they named the Norman Wells Oil Field. Over the next century, the town of Norman Wells was established and the oilfield was eventually linked to a pipeline network in 1985. In 1994, the local Sahtu Dene and Metis people created an entirely new legislative framework for resource extraction in the region when they negotiated the Sahtu Dene and Metis Comprehensive Land Claim Agreement (SDMCLCA).

The SDMCLCA gives the Sahtu Dene and Metis people significant influence over environmental management decisions. As pressure is mounting to extract non-renewable resources from Canada's north, the relatively new legal context presents an issue of what the roles, responsibilities, and obligations are for all parties.

Answering these questions will require an exploration of what meaningful and successful community engagement looks like in theory and in practice, especially in Canada's North. This research endeavors to

understand how the Sahtu Dene and Metis people have been engaged by Imperial Oil over the lifetime of the Norman Wells project, and to identify opportunities for Sahtu Dene and Metis involvement in remediation and reclamation processes. Opportunities for engagement will be determined by conducting place-specific research. It will rely on the input of those with extensive local knowledge and lived experience, and will be situated within the region's legal framework for environmental management.

Self-determination and procedural justice in a Yukon climate planning partnership

Aven Knutson, MA Student, Natural Resources and Environmental Studies

While work has been done around collaborative climate planning processes that support reconciliation between colonial institutions and Indigenous communities, this research examines how these processes meet standards of procedural justice and Indigenous self-determination that are a necessary part of Indigenous planning practices. The research documents a recent collaborative climate planning process between Government of Yukon and Indigenous partners. This planning process emphasized establishing shared strategy values and vision, co-developing priority areas for strategy focus, co-designing of public and community engagement processes, and a new shared decision-making process around which actions to include in a final policy document. This thesis applies a qualitative case study approach to take an in-depth look at Yukon settler-Indigenous relations in a changing climate. The research seeks to apply a theoretical framework of procedural justice and self-determination to this process in order to assess the suitability of this Indigenous-state planning collaboration in representing community voices and agency in the process and final policy outcomes. Semi-structured interviews and document analysis are being used to gather information on the planning process and the experiences of Indigenous government and Government of Yukon staff who were involved. A combination of western-coding and synthesis-based analysis methods are being used to preserve participant voice and context while presenting the researcher's voice and reflections. This engagement between Government of Yukon and Indigenous partners is one of the first models of this type of shared decision-making strategy. This research aims to document this process to understand its usefulness and to develop recommendations for future climate planning partnerships between colonial governments and northern communities.

How does land management impact the functional diversity of urban ground arthropods in central British Columbia?

Claire Paillard, MSc Student, Natural Resources and Environmental Studies – Biology

As cities rapidly expand, animal communities that inhabit them can experience shifts in species composition and diversity. Urban areas are often seen as degraded habitat. But they can also support very diverse arthropod communities that provide important ecosystem services in cities like pollination, nutrient-cycling, and pest-control. Urbanization can also influence arthropod traits relating to their life-history and adaptability to urban conditions. In 2015, Huber and Poirier sampled urban ground arthropods in twelve sites (N=4) in three different land use types; industrial, residential, and greenbelt areas of Prince George, British Columbia. They uncovered high diversity in industrial and residential sites compared to greenbelt sites which they suggested supported the intermediate disturbance hypothesis. I aim to know whether industrial and residential areas also support functionally diverse arthropod communities with respect to greenbelt ones, and how land use type influences insect traits. I will

compare the functional richness of insect feeding groups for greenbelt, residential, and industrial sites in Prince George. Additionally, I will examine how arthropod communities in these areas differ with respect to traits like body-size, host specificity, dispersal ability, and habitat preference. This will help cast light on whether urbanization favours certain insect traits in Prince George, and whether it influences functional diversity and related ecosystem services. Ultimately this can better inform city planners on what actions are needed to better conserve arthropod communities and ecosystem functions in urban areas.

Why learning foreign languages matters

Timur Sattarov, BA student, International and Global studies and Economics

The general goal of our project is to advance the ongoing discussion surrounding the second language requirement for students in the International and Global Studies program. Our proposed project explores the role that foreign languages play in educational pursuits throughout and after the completion of the Global and International program. For this, we have conducted qualitative in-depth interviews with the various linguistic faculty members at UNBC. We have also used a poster to present our findings. Our project finds that the pursuit of foreign languages exposes students to a number of advantages, such as increasing their available pool of employment and network opportunities. Students taking language courses at UNBC are inadvertently provided with an upgraded “toolkit” that they can utilize after graduation. The addition of the language “tool” to their “toolkit” during their studies, allows for greater access to a variety of connections and research opportunities after they graduate. Moreover, advantages such as mindfulness towards differences in cultures, an expanded capacity for understanding research (in another language), and appreciating the effects of globalization on various countries (within cultural contexts) allows for a wholesome and encompassing approach towards the international and global context.

Smokey Hollow: Urban Renewal and the Historic Displacement of a Black Community in Tallahassee

Tyler McCreary, Adjunct Professor, First Nations Studies and Geography

This poster examines how ideas of race and value intersected in an urban renewal program that destroyed the historically Black community of Smokey Hollow in Tallahassee, Florida. Beginning in the 1940s and continuing through the 1960s, urban renewal efforts across the United States displaced some of the country’s poorest communities for the purpose of municipal redevelopment, often appropriating lands deemed slums to build major road infrastructure serving suburban residents. The effect of these programs was the relocation of Black citizens who comprised the majority of these communities. In Tallahassee, the destruction of Smokey Hollow properties, which were repossessed for the construction of the Apalachee Parkway and Capitol Center in the 1960s. While the purchased properties were cleared for this urban renewal project, a large portion of them were left undeveloped. Thus, it is clear that slum clearance of Smokey Hollow, like many urban renewal projects at the time, was a thinly veiled attempt to rid parts of the city of Black citizens in order to facilitate urban road infrastructure developments supporting processes of suburbanization. Through the investigation of Florida archival documents from the 1940s to the 1960s, we hope to offer new perspectives on racial underpinnings of urban renewal efforts. Our research specifically focuses on critically reading the government archive to examine how planners and decision-makers rationalized the destruction of Smokey Hollow. Through examining the

legislative, judiciary, and bureaucratic decisions that facilitated the condemnation of these properties, we seek to expose the thinly veiled racial logic that justified these displacements.

Cancer Risk Estimation Using American College of Radiology TI-RADS for Cytologically Indeterminate Thyroid Nodules

Matthew Dickey, Medical Student, NMP

Background: We sought to determine if using the ACR TI-RADS ultrasound score combined with the Bethesda diagnosis can help augment thyroid cancer risk estimation.

Methods: TI-RADS scores and Bethesda diagnoses were collected for patients treated in our centre who had undergone thyroidectomy. Data from 186 patients with both TI-RADS scores and Bethesda diagnosis, and Bethesda diagnosis alone, was analyzed by multivariable regression analysis and observed for whether the pathology was benign or malignant.

Results: The regression analysis model showed that as the TI-RADS score increases, the odds of malignancy increases as well. The predictive value of the odds of malignancy in a thyroid nodule using both Bethesda diagnosis and TI-RADS score together was more powerful than the odds given using the Bethesda diagnosis alone.

Conclusions: Our model shows that the ACR TI-RADS score may assist with preoperative decision-making for patients with cytologically indeterminate thyroid nodules when combined with Bethesda diagnosis.

1:15pm–1:30pm Break

1:30pm–3:00pm

Applied Analysis Hub: Comparing RStudio, Stata, and Python for Analysis

Lisa Koetke: PhD candidate, NRES, Applied Analysis Hub TA

Sergio Vazquez Tagle Gallegos: MS student, NRES, Applied Analysis Hub TA

Larine Sluggett: Research Data Centre analyst

Zoom link:

<https://unbc.zoom.us/j/65122511583?pwd=R2RLSnFzeFVTRVdBOWMwTlZZRHFPZz09>

Meeting ID: 651 2251 1583 Passcode: 396829

Not sure which software/coding language to use for your analyses? We'll be comparing and demonstrating analysis in three of the main players: RStudio, Stata, and Python.

The Applied Analysis Hub (AAH) is a resource to support graduate students and upper-year undergraduate students conducting major research projects or theses at UNBC. Dedicated teaching assistants are available to help students online and face-to-face, as well as through a forum. Workshops on common skills in applied analysis, such as data management, computer languages and software, and case studies using applied analytical methods provide opportunities to expand students' skills. The TAs can also help connect students with UNBC faculty and professionals outside of the university. All parts of

students' research related to applied analysis can be addressed, ranging from selecting methods for your research question, to running analyses, to reporting results. You can learn more and book office hours at unbcaah.opened.ca