October 28th & 29th. 2016

PROGRAM GUIDE AND ABSTRACTS

2016 CANADIAN ASSOCIATION OF GEOGRAPHERS OF ONTARIO CONFERENCE (CAGONT)



CAGONT Canadian Association of Geographers - Ontario Division





HOSTED BY THE UNIVERSITY OF WATERLOO WATERLOO, ON

Website: https://uwaterloo.ca/canadian-association-of-geographersontario-division-annual-meeting/

Twitter: @CAGOnt2016 Facebook: CAGONT – Canadian Association of Geographers – Ontario Division #2016CAGONT

Table of Contents

2
2
3
3
5
5
6
7
13
15
16
37
42

General Information

Welcome to the University of Waterloo

Welcome to the 2016 Canadian Association of Geographers of Ontario hosted at the University of Waterloo. We are excited to have almost 200 contributions, from across the country and beyond.

Acknowledgements

We would like to thank the following sponsors for their generous support:

- Faculty of Environment, University of Waterloo
- Department of Geography and Environmental Management, University of Waterloo

Local Organizing Committee

The members of the CAGONT 2016 organizing committee are:

- Dr. Susan Elliott (Chair)
- Dr. Maria Strack
- Dr. Steffanie Scott
- Michael Imort
- George Atiim
- Bronwyn Lazowski
- Lacey Willmott
- Andrea Rishworth

We would also like to thank our student assistants and volunteers for their help and contributions to CAGONT 2016.

Registration Desk and Information Table

The registration desk will be open:

- Friday, October 27th from 5:00 pm to 6:30 pm in the EV1 Foyer
- Saturday, October 28th from 8:00 am to 12:00 pm in the EV3 Atrium

Wireless Internet Access

Wireless internet access is available to conference participants on the University of Waterloo Campus either by using either Eurodam or Net-ID:

1) Eurodam

Using your home institution's login information. More details on how to connect to eurodam can be found at: <u>https://uwaterloo.ca/information-systems-</u> technology/services/eduroam/connecting-eduroam-wireless-network

Connect to Wi-Fi (eduroam)

- 1. Locate the network icon in the taskbar and go to the list of wireless networks
- 2. Select eduroam and click connect
- 3. In the User name field enter your institution username
- 4. Enter your password

2) Net-ID

Net-ID access will be handed out with the registration package. Each conference participant will receive individualized usernames and passwords .To gain access to the UW network follow these steps:

1. Obtain a Guest NetID account

- 1. <u>Obtain Guest NetID account</u> (handed out with registration package)
- 2. Complete process. Be sure to record the login name and password provided
- 3. Proceed to Connect to Wi-Fi (eduroam) steps below

2. Connect to Wi-Fi (eduroam)

- 1. Locate the network icon in the taskbar and go to the list of wireless networks
- 2. Select eduroam and click connect
- 3. In the User name field enter your Net ID followed by @netid.uwaterloo.ca
- 4. In the Password field enter your Net ID password

If you require further assistance, please contact **Information Systems and Technology** through their live chat on the website: <u>https://uwaterloo.ca/information-systems-technology/</u>

Parking

Pay parking is available in lot C for \$5 a day or lot HV for \$10 a day (see campus map). Parking meters on campus are enforced 24 hours a day seven days a week. Please note that there is no overnight parking from 3:00 am to 6:00 am, unless by permission of Parking Services. Parking details can be found at https://wwaterloo.ca/parking/

Plenary Lecture and Concurrent Sessions

All conference talks will be held in the Environment Faculty buildings EV1, EV2 & EV3 (see campus map & building floor plan maps on pages 7 to 12)

Posters

Posters will be exhibited for informal browsing with opportunities for individual discussion with poster authors in the EV1 Courtyard from 8:30 am to 5:30 pm on Saturday, October 29th, 2016.

Poster presenters should do their best to be present during breaks and lunch.

Instructions for Presentations

- 3) Each presenter is allotted **15 minutes** for presentation and questions (12 minutes for presentation and 3 minutes for questions)
- 4) Please bring your PowerPoint presentation on a USB stick to your designated presentation room 10 minutes before the scheduled start of your presentation, and identify yourself to your Chair.
- 5) A digital projector will be provided in each meeting room
- 6) Each presentation room is equipped with a data projector, screen, and wireless internet access.

Session Chair Instructions

- Arrive in the session room at least 15 minutes in advance of the beginning of the session.
- Introduce presenters by name, affiliation, and title of presentation at the start of each presentation.
- Ensure that each participant starts on time and ends on time. Each presenter has 15 minutes for presentation and question period. It is the responsibility of the Session Chair that the Session finishes on time.
- Time cards will be provided in each session room. Chairs are responsible for providing presenters with time warnings.

Nutrition Breaks

Nutrition breaks take place on Saturday morning and afternoon (9:45 am & 3:30 pm) in the EV3 Atrium. Coffee, tea and snacks will be provided.

Lunch

Lunch on Saturday is provided with your registration. Lunch will take place at 1:00 pm – 2:00 pm in the EV3 Atrium. Please try to attend the CAGONT AGM in room 1408 (just off the Atrium).

Grad Student Reception

The Grad Student Reception will be held from 5:30 pm to 7:30 pm in the EV1 Courtyard on Friday October 28th, 2016.

Field Trips

Field Trip 1: Urban Field Trip: walking tour of urban Kitchener with Dr. Bob Sharpe, Wilfred Laurier University

Two urban walking tours, led by Dr. Bob Sharpe (Laurier), will navigate sidewalks and enter buildings throughout downtown Kitchener. Each walk will take a different thematic approach to the urban geography of change in the downtown.

These 2-hour walks will be limited to 15 participants. Registration is required. There is no fee. Both walks will promptly commence and end at the King Street entrance to the Kitchener City Hall.

The weather can be be cold and wet, so please dress appropriately for some brisk walking outside.

A) Westbound from Kitchener City Hall: 12:00 - 2:00 pm Theme: The Adaptive Reuse of Urban Space: Rebuilding a Sustainable Kitchener.

B) Eastbound from Kitchener City Hall: 2:30 – 4:30 pm Theme: Community Enterprise and Social Innovation in Downtown Kitchener.

Field Trip 2: *Physical Geography Field Trip: Fletcher Creek Ecological Preserve: Calcareous fen and quarry restoration from 12:15-4:30 pm*

This field trip will visit a unique wetland ecosystem fed by calcareous groundwater and visit an abandoned quarry that has undergone rehabilitation work to create wetland plant communities within the basin. Past and ongoing experiments on wetland restoration, hydrology and biogeochemistry will be discussed. Participants should be prepared to walk ~2.5 km along a graded gravel trail and dress appropriately for the weather conditions (i.e., warm clothing, waterproof jacket if rainy, sturdy shoes or boots). Bus will depart from EV3 at University of Waterloo promptly at 12:15 pm.

Social Media Contest

Make a post on Facebook, Twitter, or Instagram using #2016CAGONT and you will be entered to **WIN a \$75 Starbucks gift card!**

Rules & Eligibility:

- Posts must include #CAGONT2106
- Posts must be Public
- Posts must be original. Shares, retweets, and reposts will not count.
- Posts must be made between Friday October 28th at 12:00 pm to Saturday October 29th at 3:00 pm.

Campus Map

Link: to an interactive map of campus online: https://uwaterloo.ca/map/?basemap=D#map=16/43.4680/-80.5403



EV1 – Floor 2 Map



EV1 – Floor 1 Map





EV3 – Floor 3 Map







Program at a Glance

Friday October 28th, 2016

5:00 - 6:30	Registration (EV1 Entrance Foyer)
5:00 - 6:00	CAGONT Executive Meeting (EV1 221)
5:30 - 7:30	Grad Student Reception (EV1 Courtyard)

Saturday October 29th, 2016

8:00 - 12:00	Registration (EV3 Atrium; 1 st Floor by Williams Coffee Shop)					
0.20 0.45	Welcome and Introduction (EV3 1408)					
0:30 - 0:43			Chair: Su	san Elliott		
8:30 - 5:30			Posters on Displa	y (EV1 Courtyard)		
	Plenary Le	Plenary Lecture (EV3 1408) : Combustible Geopolitics: Fire and Change in the Anthropocene				
8:45 - 945	Dr. S	Simon Dalby , Wilfi	rid Laurier Univers	sity/Balsillie Schoo	l of International A	ffairs
	Chair: Susan Elliott					
9:45 - 10:00	Nutrition Break in EV3 Atrium					
	CONCURRENT SESSIONS					
	EV1 132	EV3 3412	EV3 3408	EV3 3406	EV3 4408	EV3 4412
10:00 - 11:30						Session 6A
						Hydrology &
	Session 1A	Session 2A	Session 3A	Session 4A	Session 5A	Biogeochemistry
	Global Health	Planning	Agriculture	Remote Sensing	Climate Change	of Restored
						Wetland
						Ecosystems
11:30 - 11:45			BR	EAK		

	EV1 132	EV3 3412	EV3 3408	EV3 3406	EV3 4408	EV3 4412	
11:45 – 1:00	Session 1B Global Health	Session 2B Special Session: Trials & Tribulations of Field Work	Session 3B Physical Geography: Soils & Water	Session 4B Special Session: Telling Better Futures	Session 5B Climate Change	Session 6B Economic/ Resource	
1.00 - 2.00	Lunch in EV3 Atrium						
1.00 - 2.00	(AGM held from 1:15 – 1:45 in EV3 1408)						
		CONCURRENT SESSIONS					
	EV1 132	EV3 3412	EV3 3408	EV3 3406	EV3 4408	EV3 4412	
2:00 - 3:30	Session 1C Aboriginal Environments	Session 2C Managed Ecosystems & Environmental Change	Session 3C Development Geography	Session 4C Planning	Session 5C Energy	Session 6C Health Geography	
3:30 - 3:45	Nutrition Break in EV3 Atrium						
3:45 - 5:15	EV1 132	EV3 3412	EV3 3408	EV3 3406	EV3 4408	EV3 4412	
	Session 1D Governance	Session 2D Food Systems/ Immigration	Session 3D Economic	Session 4D Digital/GIS	Session 5D Disasters	Session 6D Health Geography	

Plenary Lecture (EV3 1408)



Simon Dalby

Simon Dalby is the Acting Chair of the Master in International Public Policy program, a CIGI Chair in the Political Economy of Climate Change, and Professor of Geography and Environmental Studies at Wilfrid Laurier University. His published research deals with climate change, political ecology, geopolitics, global security, environmental change, militarization and the spatial dimensions of governance.

Combustible Geopolitics: Fire and Change in the Anthropocene

Professsor Simon Dalby

Wilfrid Laurier University/Balsillie School of International Affairs

As mega fires become more frequent, and fire seasons lengthen, the human response to climate change is now focused on both combustion as well as precipitation events. Fire is a relatively neglected part of the human transformation of the planet, one that is worth revisiting as a possible way to link climate adaptation, the revived interest in material geopolitics and the possibilities of extending traditional analyses of political ecology to the global scale. While great caution is needed in making large theoretical claims about physical processes in human affairs, fire offers some potentially useful insights into the Anthropocene discussion that may help with how the increasingly significant 'humanity factor' can be integrated into Earth System Science.

Concurrent Session Program

SESSION 1A: GLOBAL HEALTH Location: EV1 132 Session Chair: Elijah Bisung			
10:00 - 10:15	Neglected Tropical Diseases (NTDs) as the classic example of inequality and wellbeing in sub-Saharan Africa Ochola, E.A. & Elliott, S.J.		
10:15 - 10:30	Community health effects of surface mining in the Upper West Region of Ghana Roger Antabe, Kilian N. Atuoye, Vincent Z. Kuuire, Godwin Arku & Isaac Luginaah		
10:30 - 10:45	The community-based health planning and services and facility-based deliveries in the Upper West Region of Ghana. Joseph A. Braimah & Isaac Luginaah		
10:45 - 11:00	Community Health Workers and Maternal Healthcare in Rwanda: Barriers to the provision of adequate services Germaine Tuyisenge, Celestin Hategekimana, Isaac Luginaah, David Cechetto, & Stephen Rulisa		
11:00 - 11:15	Global Health from the Margins: Thoughts from Students Engaging in Cross- Sectoral Collaborations Lacey Willmott, Devin Waugh, & Lesley Johnston		
11:15 - 11:30	Psychosocial impacts of the lack of access to water and sanitation in low- and middle-income countries: A scoping review Bisung Elijah & Susan J. Elliott		

	SESSION 1B: GLOBAL HEALTH Location: EV1 132 Session Chair: Roger Antabe
11:45-12:00	Health-Wellbeing Nexus: An Ecological and Life Course Perspective in Theorization and Conceptualization of Health and Wellbeing Elizabeth Opiyo Onyango
12:00 - 12:15	The Everyday Health Experiences of South Sudanese Canadians in Ottawa: A Feminist Political Ecology of Health Perspective Katie MacPherson
12:15 - 12:30	Land Ownership and HIV Testing among Married Women in Nigeria Emmanuel K. Kyeremeh, Yujiro Sano, Roger Antabe & Joseph A. Braimah
12:30 - 12:45	Number of lifetime sexual partners among women and men in Ghana: An analysis of the 2014 Ghana Demographic and Health Survey Jemima N. Baada, Yuji Sano, & Roger Antabe
12:45 - 1:00	The importance of user's perceptions of recreational and drinking water in promoting sustainable water resources management: A case study of two rural water townships in eastern China Li, Sabrina & Elliott, Susan J.

SESSION 1C: ABORIGINAL ENVIRONMENTS Location: EV1 132 Session Chair: K. Karanasios			
2:00 - 2:15	Traditional Ecological Knowledge of Beluga Whale (Delphinapterus leucas) in a changing climate in the Inuvialuit Settlement Region (ISR), NWT. Devin Waugh, Peace, T., Ostertag, S., & Bradshaw, B.		
2:15 - 2:30	Places of Erasure : Assimilation impact on indigenous "sense of place" Shirley Hall		
2:30 - 2:45	The Ka'a'gee Tu Atlas: Community-based monitoring of landscape change in Kakisa, NT Kaitlin Kok		
2:45 - 3:00	Borderless Waters: An Evaluation of Indigenous Perspectives in the Mackenzie River Basin Transboundary Agreements <i>Teall Hall</i>		
3:00 - 3:15	The Uneven Impact of Water Security Issues for Inuit in Iqaluit <i>Victoria Watson</i>		
3:15 - 3:30	The diffusion of renewable electricity technologies in Canadian remote aboriginal communities using the technological innovation systems approach <i>K. Karanasios & P. Parker</i>		

Г

SESSION 1D: GOVERNANCE Location: EV1 132 Session Chair: Andrew McCarlan			
3:45 - 4:00	The use of military technologies along the US-Mexico border: the dehumanization of undocumented migrants. Monica Socorro Romero Meza		
4:00 - 4:15	Using values-association of space and place to (de)legitimise violence conducted in the war on terror. Rebekah K. Pullen		
4:15 - 4:30	Exploring neoliberal multiculturalism 'from below' <i>Erin Rose</i>		
4:30 - 4:45	Neoliberal Education Policy, Teachers' Professional Autonomy and Union Struggles in Ontario <i>Paul Bocking</i>		
4:45 - 5:00	The Rise of the Neoliberal City: Condominium Development and Toronto's CityPlace Rachel Phillips		
5:00 - 5:15	Politics that Party: Examining two alternative LGBT Pride events in Glasgow <i>Andrew McCartan</i>		

	SESSION 2A: PLANNING Location: EV3 3412 Session Chair: Claudia Aguirre
10:00 - 10:15	Planning for Estranged Retirees: Looking at the relevance of Marx's theory of Alienated-Labour to retiree's sense of place in the suburbs. Claudia Aguirre, Supervisor: Jennifer Dean
10:15 - 10:30	Planning for controversial land uses: the case of medical marijuana dispensaries (MMDs) in Toronto David Johnson & Dr. Jennifer Dean
10:30—10:45	Venturing to the 'dark side' of planning theory: A critical examination of planning for accessibility <i>Samantha Biglieri,</i>
10:45 - 11:00	The Artists of Peterborough Stephanie Murray
11:00 - 11:15	Urban Size and Academic Focus: Exploring Trends in Canadian Urban Geography, Planning and Policy Literature Maxwell Hartt Collective infrastructure without an anchor: the case of St. Catharines ●IDM industry Jeff Boggs & Stephanie Murray
11:15 - 11:30	Rethinking the Geography of Small Cities: Planetary Urbanization's Inflection Points Revington, N.

SESSION 2B: SPECIAL SESSION : TRIALS & TRIBULATIONS OF FIELD WORK Location: EV3 3412 Session Chair: Cheryl Chan		
11:45 - 12:00	Culture Shock in the Field: Overcoming Feelings of Isolation in an Unfamiliar Cultural Environment Cheryl Chan	
12:00 - 12:15	Managing Trade-Offs in Canadian Fisheries and Fisheries Research <i>Graham Epstein</i>	
12:15 - 12:30	Living and Learning with Locals: A Gender Perspective about Conducting Fieldwork in Unfamiliar Environments F. Noori Khan	
12:30 - 12:45	Let the Lessons Flow: Transforming Hardships in the Field into a New Researcher Skillset Danielle Lindamood	

SESSION 2C: MANAGED ECOSYSTEMS AND ENVIRONMENTAL CHANGE Location: EV3 3412 Session Chair: Anne Smith		
2:00 - 2:15	Feasibility and preliminary results of using mechanical compression to accelerate the return of hydrological function to restored cutover peatlands Tasha-Leigh Gauthier, Dr. Colin McCarter, Dr. Jonathan Price	
2:15 - 2:30	The Perceived Strengths and Weaknesses of Large Marine Protected Areas Artis, E.J., Gray, N.J., Gruby, R.L, Campbell, L.M., Acton, L, Howson, P, Jones, S.B., Mitchell, L., Wilson, K.	
2:30 - 2:45	Studying the Impacts of a Changing Snowpack on the Bathurst Caribou Herd, Northwest Territories Nick Wilson, Michael English, Colin Robertson, Jan Adamczewski and Roy Judas	
2:45 - 3:00	Vegetation community composition as an indicator of natural area health in Mississauga, Ontario Stephanie Varty	
3:00 - 3:15	Dendroglaciological investigations at Klinaklini Glacier, British Columbia Coast Mountains Lauren Farmer & Dan J. Smith	
3:15 - 3:30	Soil rewetting ability on a transect of soil organic carbon with sand soil texture. Hida Manns,	

Г

SESSION 2D:FOOD SYSTEMS/IMMIGRATION Location: EV3 3412 Session Chair: Blaire Cullen			
3:45 – 4:00	Embedded or Disembedded?: High-tech urban approaches to food system sustainability Alesandros Glaro		
4:00 - 4:15	Exploring shifting foodscapes during transition into permanent supportive housing in Kingston, Ontario <i>Madison Hainstock</i>		
4 :15 - 4:30	Ethno-Cultural Organizations and Local Immigration Partnerships: A Match Made in Heaven? A Case Study from Durham Region, Ontario <i>Blair Cullen</i>		

Г

SESSION 3A: AGRICULTURE Location: EV3 3408 Session Chair: Siera Vercillo	
10:00 - 10:15	Evaluating the Opportunities to Develop Organic Agriculture On the Governmental Level <i>Danshu Qi</i>
10:15 - 10:30	Characterizing China's transition pathways towards organic agriculture: a niche level case study in Nanjing, China Ning Dai
10:30 - 10:45	Production Logic of Well-Being: Considering the Non-Economic Factors of Agritourism Production in Southern Ontario <i>Susan Dupej</i>
10:45 - 11:00	Essex County Agri-Tourism: Exploring Regional and Farm-Level Diversification Heather Reid & Dr. John Smithers
11:00 - 11:15	Smallholder Agricultural Mechanization in the Northern Savanna of Ghana: Implications on Land use and Production Patterns Moses M. Kansanga & Peter Andersen
11:15 - 11:30	Debated agronomy: Public discourse and the future of biotechnology policy in Ghana Joseph A. Braimah, Kilian N. Atuoye, Siera Vercillo, Carrie Warring, Isaac Luginaah

SESSION 3B: PHYSICAL GEOGRAPHY: SOILS & WATER Location: EV3 3408 Session Chair: Wayne Forsythe	
11:45 - 12:00	Comparing Sediment Contaminant Concentrations in the St. Clair Detroit- River System K. Wayne Forsythe, Danielle E. Mitchell, Richard R. Shaker, Stephen J. Swales, Joseph M. Aversa, Daniel J. Jakubek
12:00 - 12:15	Quantifying and Mapping Soil Erosion in the Grand River Watershed Omar Dzinic, Benjamin Meinen, Caroline Kayko, Jack Su, & Derek T. Robinson
12:15 - 12:30	The importance of soil properties for tree seedling growth and survival beyond alpine treelines Emma L. Davis , Dr. Ze'ev Gedalof , Dr. Heather Hager
12:30 - 12:45	Treeline Expansion Along the Canol Heritage Trail, NWT, Canada - >70 years Post-Disturbance Geoffrey G.L. Kershaw, Steven D. Mamet, & G. Peter Kershaw
12:45 - 1:00	Widespread drying of the Peace-Athabasca Delta, Alberta, Canada Remmer, Casey, B.B. Wolfe , R.I. Hall

SESSION 3C: DEVELOPMENT GEOGRAPHY Location: EV3 3408 Session Chair: Peter Deadman	
2:00 - 2:15	The Gendered Spaces of Volunteer Tourism <i>Amy Kipp, Drs. Roberta Hawkins & Noella Gray</i>
2:15 - 2:30	"We can't stay poor": rural youth motivations to engage in artisanal small- scale mining in Ghana. Lydia Osei, Godwin Arku & Isaac Luginaah
2:30 – 2:45	"I want to develop myself, and my village": A Community Approach to Education in the Luang Prabang Region, Laos Langill, Jennifer C.
2:45 - 3:00	Gated communities, equity, and spatial fragmentation in Greater Accra, Ghana Emmanuel Kyeremeh, Hanson Nyantakyi-Frimpong, Godwin Arku
3:00 - 3:15	Correlates of Women's Autonomy in the Democratic Republic of Congo Florence Wullo Anfaara*, Yujiro Sano, Roger Antabe and Isaac Luginaah
3:15 - 3:30	Exploring the resilience of households in the Amazon estuary; an agent based simulation. <i>Peter Deadman & Yue Dou</i>

SESSION 3D: ECONOMIC Location: EV3 3408 Session Chair: Nancy Worth	
3:45 - 4:00	Financial Constraints of China's Small and Medium Enterprises <i>Ruilin Yang & Albert Berry</i>
4:00 - 4:15	Re-examination of the Semple and Phipps model of the dispersion of corporate headquarters <i>Martin R Lefebvre & Grant L Morin</i>
4:15 - 4:30	Consultants and Convergence of Economic Development Policy in Ontario, Canada Evan Cleave, Merlin Chetwood, & Godwin Arku
4:30 - 4:45	Governing the Phoenix Islands Protected Area: The Politics of Decision- Making Mitchell, Lillian
4:45 - 5:00	The privilege of a parental safety net: Millennials and the intergenerational transfer of wealth and resources Nancy Worth
5:00 - 5:15	"An analysis of the mode of the production of gendered space" Case studies : Madar and Qazvin Squares in Tehran,Iran Anahid Shirkhodaee

SESSION 4A: REMOTE SENSING Location: EV3 3406 Session Chair: Brandon Walker	
10:00 - 10:15	Application of fixed-wing Unmanned Aerial Systems for high-resolution documentation of snowmelt water budget across shrub-tundra landscapes Branden Walker, Philip Marsh, Philip Mann, Tyler deJong
10:15 - 10:30	Mapping and Monitoring Monarch Habitat with Unmanned Aerial Vehicles <i>Robinson, D.T. & Ridge, J.</i>
10:30 - 10:45	Analysis of habitat restoration using Remote sensing and GIS: A Case Study of Northwest Beach, Point Pelee National Park, Ontario, Canada. Nayak, P., & Byrne, M-L.
10:45 - 11:00	Investigating grassland properties usinghelicopter-acquiredhigh-spatial resolution hyperspectralimagery Bing Lu, Cameron Proctor, & Yuhong He
11:00 - 11:15	Temporal-spectral trajectory based change detection and classification for bamboo-dominated forests in Southern Brazil Clara J. Greig, Colin Robertson & Andre E. B. Lacerda
11:15 - 11:30	Applications of RADARSAT-2 polarimetric data for assessing degraded white mangrove forests Duncan J. E. Hill, John M. Kovacs & Francisco Flores-de-Santiago

SESSION 4B: SPECIAL SESSION TELLING BETTER FUTURES Location: EV3 3406 Session Chair: Scott David Morton	
11:45 - 12:00	Decarbonization Waterloo Region: Participatory learning in a local energy transition Scott David Morton
12:00 - 12:15	Addressing complexity using multiscale scenario analysis: An overview and future agenda for Canada's energy scenarios Jude Herijadi Kurniawan & Vanessa Schweizer
12:15 - 12:30	The best strategy to cope with crop price shock—a case study using agent- based model Yue Dou , Peter Deadman, Marta Berbes, Derek Robinson, & Dawn Parker
12:30 - 12:45	Sixty years of valuation studies for weather and climate forecast services: A meta-analysis Million Tadesse & Brian Mills

SESSION 4C: PLANNING Location: EV3 3406 Session Chair: Wendy Burton	
2:00 - 2:15	Small Towns in Transition: An Exploratory Study in Collingwood, Ontario Sha Chang & Sanjay K. Nepal
2:15 - 2:30	Evaluating the effects of road network structure on traffic congestion and retail store sales Junyi Wang & Derek T. Robinson
2:30 - 2:45	Seeking Integrity between Green Infrastructure and Intensification Sara Saboonian & Pierre Filion
2:45 - 3:00	Headphones and Urban Space: Building Soundscapes of Resistance Brown, S. & Dean, J.
3:00 - 3:15	Exploring the use of social values to facilitate public participation in highly regulated environmental management decisions <i>Philpot, S., Hipel, K., & Johnson, P.</i>
3:15 - 3:30	"Raising Social Capital for Green Infrastructure: The Role of Civil Society in Greenspace Protection in the Toronto Region" Wendy Burton

SESSION 4D: DIGITAL/GIS Location: EV3 3406 Session Chair: Peter Johnson	
3:45 - 4:00	#happy: land use and happiness Eric Vaz
4:00 - 4:15	Local multicriteria analysis and agent-based models for simulating urban land use patterns Hossein Hosseini, & Jacek Malczewski
4:15 - 4:30	Evaluation of Municipal Government Mobile Applications for 311 Service Requests <i>Qing Lu & Peter Johnson</i>
4:30 - 4:45	Quality Evaluation of Volunteered Geographic Information: The Case of OpenStreetMap Hongyu Zhang
4:45 - 5:00	Listening to the Users: Improving Online Tools and Data Access at the Polar Data Catalogue Gabrielle Alix, Dana Church, Yunwei Dong, Colin Fagan ,David Friddell, Julie Friddell, Frank Lauritzen, Ellsworth LeDrew, Tristan Mills, Garret Reid
5:00 - 5:15	Models of direct editing of government spatial data: Challenges and constraints to the acceptance of contributed data Peter A. Johnson

SESSION 5A: CLIMATE CHANGE Location: EV3 4408 Session Chair: Johanna Wandel	
10:00 - 10:15	Rainwater harvesting as adaptation to climate change: an interdisciplinary question Johanna Wandel
10:15 - 10:30	An Operational Winter Severity Index for Winter Highway Maintenance in Ontario, Canada Lindsay Matthews*, Jean Andrey [,] Ivan Minokhin [,] Max Perchanok
10:30 - 10:45	Evolution of winter temperature in Toronto, Ontario, Canada: A case study of winters 2013-14 and 2014-15 <i>Conor I. Anderson & William A. Gough</i>
10:45 - 11:00	The experiences and perceptions of flood-prone Canadians: Preliminary results from a national flood risk perception survey Dr. Jason Thistlewaithe, Dr. Daniel Henstra, Dr. Daniel Scott, & Dr. Craig Brown
11:00 - 11:15	Opportunities and Constraints for Coastal Adaptation in Metro Vancouver <i>A. Rutledge</i>
11:15 - 11:30	Applying a novel theoretical framework to recreation and tourism research: The case for Protection Motivation Theory Stephanie Verkoeyen, University of Waterloo

SESSION 5B: CLIMATE CHANGE Location: EV3 4408 Session Chair: Brenda Murphy	
11:45 - 12:00	Climate-induced environmental change and the future of tourism at the Athabasca Glacier <i>Weber, M. , Lemieux, C.J. , Groulx, M. & Scott, D.</i>
12:00 - 12:15	Enhancing planning and preparedness capacities for climate change resilience in Wawa, Ontario: A community-based photovoice approach <i>Russo, Samantha</i>
12:15 - 12:30	Using Photovoice to Understand Climate Change Adaptation in Rural Ontario Hissa, K.
12:30 - 12:45	Climate risk and knowledge mobilization in the transportation sector <i>Jean Andrey</i>
12:45 - 1:00	Measuring the Effectiveness of an Outdoor Education Program on High School Students' Knowledge, Attitudes, and Behaviours Towards Climate Change – <i>Climate Change S.O.S. – Save Our Syrup!</i> Dr. Brenda Murphy & Bryce Gunson

Г

SESSION 5C: ENERGY Location: EV3 4408 Session Chair: Nick Mercer	
2:00 - 2:15	Assessing the impacts and perceptions of smart grid interventions on suburban residential energy culture Lazowski, B., Parker, P. & Rowlands, I. H.
2:15 - 2:30	Sustainable Energy in Northern Communities Stephanie Pike
2:30 - 2:45	Barriers to Renewable Energy Development in Newfoundland and Labrador: A Case Study of Wind Energy Applying the 'AKTESP' Analytical Framework Nick Mercer
2:45 - 3:00	Lessons from the past: Why we should not overlook social transformation trends following resource booms Halima Goumandakoye

<i>SESSION 5D: DISASTERS</i> Location: EV3 4408 Session Chair: L. Chakrabarty	
3:45 - 4:00	Build Back Better Disaster Recovery in Java, Indonesia: Keys to Success in Village Reconstruction and Relocation Woodhall, B.
4:00 - 4:15	Change Detection from Landsat: 2004 Indonesian Tsunami Marissa I. Chase & Tarmo K. Remmel
4:15 - 4:30	Public attention to environmental hazards Amber Silver and Jean Andrey
4:30 - 4:45	Integrated community-based disaster risk reduction approach to flood risk management: a good practice project in Ayutthaya, Thailand <i>Chakraborty, L.</i>

SESSION 6A: HYDROLOGY & BIOGEOCHEMISTRY OF RESTORED WETLAND ECOSYSTEMS Location: EV3 4412 Session Chair: Maria Strack	
10:00 - 10:15	Dissolved organic carbon dynamics in a constructed fen in the Athabasca Oil Sands Region, Alberta S.E. Irvine, M. Strack, & J.S. Price
10:15 - 10:30	Energy, water and carbon fluxes from a constructed boreal wetland <i>Clark, M. G., Humphreys, E.,, & Cary, S.</i>
10:30 - 10:45	Ebullition from Marsh Sediments after Wetland Restoration Victoria Wisniewski, Monika Havelka, &Tim Duval
10:45 - 11:00	The Role of Vascular Plants in N₂O Emissions from Restored Peatlands Martin E. Brummell, Cristina Lazcano, & Maria Strack
11:00 - 11:15	Using the Tea Bag Index to characterize decomposition rate in restored peatlands MacDonald, E., Gauthier, T., Elliott, J., Turmel-Courchesne, L., Touchette, S., Bieniada, A., Saraswati, S., Engering, A., & Strack, M.
11:15 - 11:30	Quantifying topography at the landscape level for large reclamation projects <i>Collin Branton & Derek T. Robinson</i>

Г
SESSION 6B: ECONOMIC/RESOURCE Location: EV3 4412 Session Chair: Patrick Lawrence	
11:45 - 12:00	The (re)production of nature on natural resource based reality television Kendal Clark, Jennifer J. Silver, and Roberta Hawkins
12:00 - 12:15	Measuring the Economic Impacts of Protected Areas on Nearby Communities Catharine Brazeau
12:15 - 12:30	20 Years Later -Evolution or (De)Evolution of Ontario Great Lakes Shoreline Management Plans, 1995-2015: A Case Study of Elgin County. Patrick Lawrence

	SESSION 6C: HEALTH GEOGRAPHY Location: EV3 4412 Session Chair: Kathi Wilson
2:00 - 2:15	Thinking relationally about built environments and physical activity: A study of adult walking behavior in Waterloo, Ontario Jennifer Dean, Michael Drescher, Jeff Casello, Anna Garnett & Troy Glover
2:15 - 2:30	In search of greener pastures: Migration decision-making of Filipino nurses Maddy Thompson
2:30 - 2:45	The Social Disorganization of Intimate Partner Violence Anthony Piscitelli
2:45 - 3:00	Rural Community Conflict and Biosolid Facility Siting: Where are we now? Sarah Mason-Renton & Isaac Luginaah
3:00 - 3:15	A spatial analysis of breast cancer in Southern Ontario Jenny Tjhin, Isaac Luginaah
3:15 - 3:30	Migration, Health and Temporary Foreign Workers: Examining Health and Access to Health Care among Filipina Live-in Caregivers in the Greater Toronto Area, Ontario, Canada Jessica Carlos & Kathi Wilson

SESSION 6D: HEALTH GEOGRAPHY Location: EV3 4412 Session Chair: Jenna Dixon	
3:45 - 4:00	New Brain Geographies: Living with Chiari Malformation <i>Gavin J. Andrews</i>
4:00 - 4:15	Rundown by the wolf: exploring the relationship between gender and economic marginalization for Canadians with Systemic Lupus Erythematosus (SLE)" Jenna Dixon, Susan J. Elliott & Ann E. Clarke
4:15 - 4:30	School nutrition policy compliance in Ontario and Alberta: An environmental assessment of secondary school vending machine data from the COMPASS Study Vine, M.M., Harrington, D.W., Butler, A., Patte, K., Godin, K., & Leatherdale, S.T.
4:30 - 4:45	Global Migration and Chronic Inflammatory Diseases: Examining Health Literacy among South Asian Populations Dr. Ivy Dam, Gurveer Bains & Dr. Kathi Wilson
4:45 - 5:00	What does it mean to live with a chronic illness? Investigating the geographies of food allergy in Ghana George A. Atiim & Susan J. Elliott
5:00 - 5:15	Using Knowledge Exchange Strategies to Enhance Research Impact: Lessons Learned from the COMPASS Study Kristin M. Brown, Susan J. Elliott & Scott T. Leatherdale

Г

Posters (Alphabetical order by first author)

Production in Alternative Agriculture: Understanding labour on certified organic farms in Ontario, Canada

Lucas Bramberger & Dr. Evan Fraser

Modelling Urban Snow Melt in Waterloo, Ontario Paul Donchenko & Richard Kelly

Abandoned Oil Well-Pad Peatland Reclamation *Ali Engering, Maria Strack, Bin Xu & Melanie Bird*

Lyme Disease and Deforestation: A realist systematic review *P.M. Enright*

Developing baseline knowledge of water and metals supplied by the Peace River to the Peace-Athabasca Delta, northern Alberta, using paleolimnology Faber J., T. Owca, R.I. Hall & B.B. Wolfe

Spatial use patterns in three income-differentiated Hamilton (ON) Census Tracts Milton J. Friesen

Navigating the Complex Seafood Certification Landscape: An Analysis of Decision Making among Atlantic Lobster Harvester Groups Larissa Goshulak, Dr. Jennifer Silver & Dr. Benjamin Bradshaw

The effect of Double-crested cormorant (*Phalacrocorax auritus*) associated tree mortality on invasive European fire ants (*Myrmica rubra*) at Tommy Thompson Park, Toronto, Ontario Aditi Gupta & Gail S. Fraser

Lucky Realizations of the Snow-AO Relationship in CMIP5 Models Tyler Herrington & Dr. Chris Fletcher

Lake Ice/Water Segmentation of Dual Polarization RADARSAT-2 SAR Imagery with the Iterative Region Growing using Semantics Algorithm Marie Hoekstra, Claude Duguay, & David Clausi

Discerning Effects of Multiple Stressors on Lakes of the Athabasca Delta using Paleolimnology

Mitchell L. Kay , Erin MacDonald , Kristen Wesenberg , Kathleen Brown , Jasmina Vucic , Laura Neary , Johan A. Wiklund , Roland I. Hall & Brent B. Wolfe

Mississauga's urban forest: Assessing local and regional climate vulnerability Talha Khan & Dr. Tenley Conway

Is the Athabasca River Being Polluted from Alberta Oil Sands Development? Klemt, Wynona H., Roland I. Hall & Brent B. Wolfe

Statistical Downscaling Future Soil Temperature at a Northern Airport in Quebec Andrew C.W. Leung, Tanzina Mohsin & William A. Gough

Susceptibility and Risk Assessment of Earthquake-induced Landslides Using An UAVbased Approach

Rui Liu, Saied Pirasteh, & Jonathan Li

Assessment of Cultivated Land Pressure Status in China Xiaofang Liu, Yajie Zhang, Jonathan Li, & Lingfei Ma

Experiences of Community Gardens Participants in Different Types of Gardening Spaces Adrian Lue, & Dr. Tenley Conway

Should Driverless Cars Still Need Road Maps?

Lingfei Ma, Jonathan Li, & Simon H. Zhao

Mapping Pevensey Bay: The Historical, Environmental and Cartographic Evidence Christopher Macdonald Hewitt

Evaluating retrievals of soil moisture from C-Band SAR to changes in vegetation across two growing seasons

Josh MacDougall, Aaron Berg, Tracy Rowlandson, Elené Ueckermann & Jenelle White

Examining initiatives to reintroduce Indigenous cultivation and management practices in State-led parks and protected areas *Samantha McGee, Jennifer J. Silver & Robin Roth*

Effect of biochar on soil health, greenhouse gas emissions and climate change resilience Mechler, M. A. & Oelberman, M.

Use of photosynthetic pigments to track hydroecological conditions of lakes in the Peace-Athabasca Delta, a floodplain downstream of major energy projects Eva Mehler, Casey Remmer, Roland I. Hall, Brent B. Wolfe, Joshua Thienpont & Jules Blais

Mapping a large-scale dieback of mangroves in Australia's Gulf of Carpentaria using a Landsat 8 time series

Hailey S. Morning, Duncan J.E. Hill, John M. Kovacs, & Norman C. Duke

Play Deserts as Health Inequities? Mapping Playground deserts and socioeconomic deprivation in Kingston, ON

Allison Murray & Jeffrey R. Masuda

Re-estructuration économique et ses effets espaciaux à Porto Alegre, Brésil. *Joel Outtes*

Le réseau des réseaux urbains: La géographie de l'Internationale Urbaine (1851aujourd'hui) *Joel Outtes*

Development and Evaluation of a Generalized Online Spatial Argumentation Platform

Pierre, J. & Rinner, C.

Review of data collection methods for post-harvest tillage residue assessment Neal Pilger, Aaron Berg, Renato Pardo, & Joshua Antinolfi

> **Emergent technologies in Precision Agriculture / Viticulture** Neal Pilger, Mike Duncan, & Joshua Antinolfi

LiDAR derived DEM for improving hazards and geomorphology analyses of river mobility Saied Pirasteh & Jonathan Li

Identifying the common geographical pattern of crime and health: Applying a Bayesian shared component model to analyze violent crime and attempted suicide in Waterloo Region

Matthew Quick & Jane Law

The uncertain health geographies of kidney transplant patients in Guadalajara, Mexico Carlos E. Sanchez-Pimienta, Paulina Madrigal-Vargas, & Jeffrey Masuda

A Critical Analysis of State-Led Recovery of Endangered Species Using the Case Study of Northern and Southern Resident Killer Whales in British Columbia, Canada Megan Sutton

> **The Retail Invasion: New Foreign Chains in Canada** Stephen Swales, Wayne K. Forsythe & Joseph Aversa

Carbon and methane exchange in a restored peatland: evaluating the role of three graminoid species

Touchette, S. & Strack, M.

Weather and Hydrological Data for the CCRN Special Observation and Analysis Period in the Western Canadian Arctic.

M. Tsui, P. Marsh, B. Walker, P. Mann & E. Wilcox

Assessing the Spatial and Temporal Trends of Seasonal Ice in a peatland in the Western Boreal Plains; Methods and Preliminary Results Brandon Van Huizen & Dr. Richard M. Petrone

Meeting the Demand for Geoscience Information?: A Jurisdiction Scan of Canadian Provincial Surveys' Geohazards Programs and Projects Shona L. van Zijll de Jong

Geoscience Research, Canadian Radon RiskScapes and Public Safety Decision Making Shona van Zijll de Jong & Matthew Leybourne

Monitoring Rainwater Harvesting Systems in India Using Satellite Remote Sensing Observations Vanthof, V.R. & Kelly, R.E.J.

> Water risk-perception in Nyanchwa, Kenya Joann Varickanickal, Elijah Bisung & Susan Elliott

The hydrological importance of a spatiotemporally variable frost table in the western Canadian Arctic *Evan Wilcox, Dawn Keim, Phil Marsh, Andrew Ireson, Branden Walker, & Philip Mann*

Using rLakeAnalyzer and Constant Monitoring Buoys to Track Cyanobacteria Bloom Development in Callander Bay and Wasi Lake, Ontario *Kyle Wittmaier*

Characterizing the Spatial Extent of a Basal Channel Under Antarctica's Nansen Ice Shelf Using Low Frequency Ground Penetrating Radar. Peter Wray

Identification of Building Surface Materials Using Hyperspectral Remote Sensing Imagery Chengming Ye, Saied Pirasteh & Jonathan Li

Common attributes in trees: a case study of the private urban forest in the Greater Toronto Area *Vivian Yip & Tenley Conway*

Food by Ward: Food Assets and Opportunities in Toronto Laine Young

Determination of Forest Inventory Parameters Using a Terrestrial Laser Scanner Simon H. Zhao, Jonathan Li & Linfei Ma

Challenges in evaluation of safety effect of roundabouts

Yue Zhao, Jean Andrey & Peter Deadman

Abstracts (Alphabetical order by first author)

Planning for Estranged Retirees: Looking at the relevance of Marx's theory of Alienated-Labour to retiree's sense of place in the suburbs

Author: Claudia Aguirre, University of Waterloo

Supervisor: Jennifer Dean

This paper examines suburban neighborhoods' built environments as potential mitigators or catalysts for social isolation and alienation during retirement. Studies on social isolation have focused on it's heath risks for retirees and offered suggestions for inclusion. Additionally, the WHO's guide for age-friendly communities highlights how transportation, access to services, and social activity are all interconnected and part of an age-friendly community. Through this paper, I suggest that social isolation during retirement functions as a form of alienation. I look at early Marx's notion of alienated labour and suggest that retiring in a suburban community can trigger a secondary form of estrangement from others and from self. Using Marx's theory, I draw connections between retirees' sense of estrangement and sense of place. Through this I offer a new theoretical lens through which we can examine the places in which older adults live and add to the research on age-friendly communities and aging-in-place. I end by proposing that built environments could either contribute to an overall sense of alienation, by enabling a sense of estrangement from place, or help mitigate it, in neighborhoods that lend themselves well to civic engagement, social activity, and community building for older adults.

Listening to the Users: Improving Online Tools and Data Access at the Polar Data Catalogue

Author(s) and Affiliations:

Gabrielle Alix¹ Dana Church¹ Yunwei Dong¹ Colin Fagan¹ David Friddell¹ Julie Friddell¹ Frank Lauritzen¹ Ellsworth LeDrew¹ Tristan Mills¹ Garret Reid¹

¹Polar Data Catalogue/Canadian Cryospheric Information Network, University of Waterloo

Abstract:

The Polar Data Catalogue (PDC) of the Canadian Cryospheric Information Network (CCIN) is a data archive and educational outreach project at the University of Waterloo. We are Canada's primary source for data and information about snow, ice, and cold regions. The PDC archives and serves online data from Canadian and international polar research programs and currently holds over

2,400 metadata descriptions of datasets, 2.7 million data files, and 27,700 RADARSAT images of northern Canada and Antarctica.

To improve service to researchers, northern and Indigenous Canadians, decision makers, and the public, CCIN is expanding user services to enhance understanding of and access to our Arctic and Antarctic collections. In response to user demand, on the CCIN website (https://ccin.ca/), increasingly, data are examined using interactive visualization tools which are easy to implement and intuitive to understand. Along with recent user-driven improvements to our PDC Data Input application and our low-bandwidth PDC Lite data search application (https://polardata.ca) which serves northern users with limited Internet speeds, we are currently redesigning our full-featured PDC Data Search application to address user requests regarding the interface and functionality. Since 2015, we have conducted workshops to teach principles of data management and engage users from diverse backgrounds. Through these and other activities, we hope to enhance usefulness to our users and make the data and information contained in the PDC more accessible and relevant to Canadians and the world.

Keywords (up to 4):

Data management, User engagement, Data access, Online tools

Evolution of winter temperature in Toronto, Ontario, Canada: A case study of winters 2013-14 and 2014-15

Conor I. Anderson and William A. Gough

Dept. of Physical and Environmental Sciences, University of Toronto Scarborough, 1265 Military5 Trail, Scarborough, Ontario M1C 1A4, Canada.

Abstract:

Globally, 2014 and 2015 were the two warmest on record. At odds with these global records, Canada experienced anomalously cold weather during the 2013–14 and 2014–15 winters. This study sought to contextualize these cold winters within a larger climate context in Toronto, Ontario, Canada. Toronto winter temperature (Tmax, Tmin, and Tmean) for the 2013–14 and 2014–15 seasons were ranked among all winters for three periods: 1840–41 to 2015 (175 winters), 1965–66 to 2015 (50 winters), and 1985–86 to 2015 (30 winters). The average warming trend for each temperature metric during these three periods were analyzed using the Mann-Kendall test and Thiel-Sen slope estimation. Winter 2013–14 and 2014–15 were the 34th and 36th coldest winters in Toronto since record-keeping began in 1840. Toronto winter temperatures have warmed considerably since winter 1840-41. The Mann-Kendall analysis showed statistically significant monotonic trends in winter Tmax, Tmin, and Tmean in the last 175 years, and the last 50 years. These trends notwithstanding, in the last 30 years there has been no clear signal in Toronto winter temperature. The last 30 years also show more variation than the previous 50 years, indicating a larger range of temperatures. This was confirmed by a statistically significant increase in diurnal temperature range, between 1985-86 and 2015, indicating an expansion of winter extreme temperatures during that period. We find no direct influence of major teleconnections on winter temperature in Toronto, but identify anomalies in the position of the jetstream during these cold events.

Key words: climate change, winter temperature, time series analysis, polar Jetstream

New Brain Geographies: Living with Chiari Malformation

Gavin J. Andrews. McMaster University (oral paper)

Health geographers have considered the brain in terms of living with mental illness and the nature of mental health care and, to a lesser extent, with regard to intellectual disability. They have however, like most social scientists, neglected physical/structural brain abnormalities and defects. This presentation considers the spatial experience of living and coping with Type 1 Chiari Malformation; a condition affecting one in a thousand people - mainly children and young adults whereby the cerebellar tonsils incorrectly extend and push through the base of the skull (symptoms including headaches, vertigo, impaired coordination, disorientation and weakness). In terms of nexus thinking, through qualitative research the study considers the intersections of three domains (i) home and social space which, although being meaningful anchors and positive environments for sufferers, are no longer so positively affective because the debilitating condition blocks sufferers from basic movement and energy, making them feel out of sync with what is taking place around them and their former lives more generally. (ii) medical space, which although potentially curative and transformative, is itself complex, uncertain and frightening. (iii) support space - often cyberspace – through which sufferers can attain both accurate and inaccurate information and share good and bad experiences. These domains are interrelated in multiple ways, and each clearly possesses both positive and negative attributes.

Key words: brain, affect, qualitative, chronic, pain

Climate risk and knowledge mobilization in the transportation sector

Jean Andrey, University of Waterloo

After a brief overview of the evolution of anthropogenic climate change as a global environmental issue, reflections are offered on the role and readiness of university researchers, and especially geographers, in addressing associated risks. Examples are provided from the transportation sector, where weather-related collision patterns underscore the need for more "intentionality" and "substantiality" in climate-risk response.

Key Words: climate change, adaptation, transportation, risk

Correlates of Women's Autonomy in the Democratic Republic of Congo

Florence Wullo Anfaara^{1*}, Yujiro Sano², Roger Antabe¹ and Isaac Luginaah³

- 1- Environmental Hazards and Health Lab, Department of Geography, Western University, London Canada
- 2- Department of Sociology, Western University, London Canada
- 3- Department of Geography, Western University, London Canada

Abstract

Women's household decision-making autonomy is associated with positive health-seeking behaviours such as antenatal care visits and contraceptive use. Yet, correlates of women's autonomy in post-conflict settings like the Democratic Republic of Congo (DRC) have been less documented. Drawing data from the 2013-2014 DRC Demographic and Health Survey and applying ordinary least squares technique, we aimed to fill this important void. Our findings indicate that demographic, sociocultural, and socioeconomic factors were strongly correlated with women's autonomy. For example, compared to Kinshasa, women in all other provinces had lower autonomy. Also Muslim women and women from other religions had lower autonomy than Christian women. We also found that richer, more educated, and employed women had higher autonomy than their poorer, less educated, and unemployed counterparts. These findings suggest that intervention programs in empowering women in the DRC through formal education and provision of socioeconomic opportunities while addressing cultural practices that are harmful to women's decision-making autonomy are needed.

Key Words: Democratic Republic of Congo; Women's autonomy; Demographic and Health Survey; Conflict; Kinshasa

Community health effects of surface mining in the Upper West Region of Ghana

Roger Antabe^{1*}, Kilian N. Atuoye¹, Vincent Z. Kuuire², Godwin Arku³ and Isaac

Luginaah³

- 1- Environmental Hazards and Health Lab, Department of Geography, Western University, London Canada
- 2- Department of Geography and Planning, Queens University, Kingston Canada
- 3- Department of Geography, Western University, London Canada

Abstract

The emergence of a gold mining industry and the influx of Artisanal Small Scale Mining following recent discoveries of gold deposits in Northern Ghana have posed new socio-cultural, economic, environment and health challenges for residents in this dry savannah zone that is already facing negative consequences of environmental change. Yet, knowledge of the impact of this emerging industry on the health of local population has been lacking. Furthermore, the extent to which residents in host communities perceive mining activities to impact their health has been nascent. Using a cross sectional data (n=801) and applying negative log-log model, this study examines residents' Self-rated Health (SRH) in mining host communities in the Upper West Region of Ghana. The findings suggest that while uncertainty (neutral) about the health impact of odours from mining activities is associated with poor SRH in both impacted and affected communities (OR=2.01, $p \le 0.001$; OR=1.53, $p \le 0.1$ respectively), only residents in impacted communities who believe odours from mining has negative health implications were associated with poor SRH (OR=1.98, $p \le 0.001$). Witnessing dust pollution in homes, however, was not associated with poor SRH in the study context. Moreover education, older age, wealth, religion and district of residence were associated with poor SRH. The findings suggest mining activities may be exacerbating the already stressed environment and contributing to poor health. The study recommends an urgent need to reassess Ghana's Minerals and Mining Act by actively involving residents in host communities in mine leases while enforcing strict environmental best practices.

Key words: Ghana; Upper West Region; Mining; Self-rated Health; Impacted; Affected

The Perceived Strengths and Weaknesses of Large Marine Protected Areas

Artis, E.J¹., Gray, N.J¹., Gruby, R.L², Campbell, L.M³., Acton, L³., Howson, P²., Jones, S.B³., Mitchell, L¹., Wilson, K².

¹ Department of Geography, University of Guelph

² Department of Human Dimensions of Natural Resources, Colorado State University

³ Nicholas School of Environment, Duke University

Large marine protected areas (LMPA) are marine protected areas (MPA) greater than 100,000km². They are seen as pivotal for meeting global conservation targets. Conventional MPAs on average are less than 5km² and are generally established in coastal areas. Due to their proximity to populated areas there has been much research done on their strengths and weaknesses in relation to social, economic, political, and ecological outcomes. However, less is known of LMPAs which tend to protect vast and remote ocean spaces. Recently scholars have begun to debate the strengths and weaknesses of LMPAs as conservation tools due to their unique human dimensions. Whereas some argue they are easy conservation 'wins', protecting entire ecosystems, others argue LMPAs unfairly harm marginalized stakeholders. The purpose of this study is to better understand perceptions of the strengths and weaknesses of LMPAs in relation to diverse values for ocean-space. This study used Q Methodology, a mixed qualitative and quantitative method that uses factor analysis, to determine common points of view held by different stakeholders. We interviewed 40 key actors from five established and proposed LMPA sites, including: Marianas Trench Marine National Monument, United States; the Phoenix Islands Protected Area, Kiribati; National Marine Sanctuary, Palau; and the proposed LMPAs in Bermuda and Rapa Nui (Easter Island), Chile. Preliminary results of the Q Method analysis highlight the characteristics of two dominant perspectives across LMPA sites. The dominant view is supportive of LMPAs whereas the second view is more critical of LMPAs.

Keywords: large marine protected areas, Q Method, environmental conservation

What does it mean to live with a chronic illness? Investigating the geographies of food allergy in Ghana

George A. Atiim and Susan J. Elliott Department of Geography and Environmental Management, University of Waterloo, Ontario, Canada

Abstract

Food allergy [FA] is no longer an isolated disease of western countries. Research suggests its reach has become global as developing countries join the FA epidemic. As incidence and prevalence of FA are documented, there is a need to understand the perceptions and experiences of living and coping with a FA. In this exploratory study involving twenty [20] in-depth interviews with food allergic individuals, we unpacked the lived experiences relating to psychosocial burden and coping strategies. FA impacted on the psychological [e.g. anxiety and fear], social [e.g. stigmatization], and economic [e.g. medical fees] wellbeing of participants. Important insights also emerged around the role of social context [e.g. inadequate information] in understanding how participants cope with food allergies. This study is important as a first step towards understanding the needs and multiple experiences of the allergic population in the developing world and the societal context in which FA

is contested. It also highlights the need for both public health policy and research initiatives to address these concerns.

Key words: Food Allergy, Social Exclusion, Qualitative, Ghana

Number of lifetime sexual partners among women and men in Ghana: An analysis of the 2014 Ghana Demographic and Health Survey

Jemima N. Baada¹; Yuji Sano²; Roger Antabe¹ ¹Department of Geography, Western University ²Department of Sociology, Western University

Abstract

Although research has paid attention to risky sexual behaviours, only few studies have documented number of lifetime sexual partners in sub-Saharan Africa including Ghana. Drawing data from the 2014 Ghana Demographic and Health Survey and utilizing Poisson logistic regression technique, we explored factors associated with number of lifetime sexual partners in Ghana. Findings indicate that complex sets of behavioural, demographic, and sociocultural factors were correlated with number of lifetime sexual partners. For example, women and men with HIV transmission myths had higher risk of having more sexual partners than those without such myths. Moreover, compared to their Akan counterparts, women and men from Northern ethnic groups had lower risk of having more sexual partners than their Christian counterparts. For socioeconomic factors, richer, more educated, and employed had higher risk of having more sexual partners than their Christian counterparts. For socioeconomic factors, richer, less educated, and unemployed counterparts. Based on these findings, there is an urgent need for policymakers to target populations at risk in further reducing vulnerabilities associated with having more lifetime sexual partners.

VENTURING TO THE 'DARK SIDE' OF PLANNING THEORY: A CRITICAL EXAMINATION OF PLANNING FOR ACCESSIBILITY

Samantha Biglieri, M.Pl.

PhD Student, School of Planning, University of Waterloo Contact: samantha.biglieri@uwaterloo.ca

Abstract

Recent research has called for an acknowledgement of power in planning practice, in reaction to the dominant communicative theory paradigm - the notion that with the right conditions, Habermas' apolitical 'Ideal Speech Situation' can take place and all voices can be heard in the planning process (Flyvberg & Richardson, 2002). One area of planning practice that is not typically afforded much space within planning schools or theoretical development is that of planning for accessibility (Lewis, 2011). In an effort to acknowledge power in planning for accessibility, this paper uses the Foucauldian concepts of disciplinary power, governmentality and the great confinement to: (1) Critically assess the underlying assumptions in how we plan for people with disabilities in our cities; (2) Briefly seek to understand why people with disabilities are excluded from public spaces; and (3) Apply these concepts to an existing institution designed to include the voices of disabled persons within local decision making in Ontario, known as Municipal Accessibility Advisory Committees (MAACs). While MAACs could be considered an overall success when viewed through a communicative theory lens, when viewed through a Foucauldian analysis of power relations, it was possible to problematize and therefore identify issues to be addressed. This paper has identified

several themes where considerations of power need to be examined in future research and policy development, including: limited influence of the committee, assumptions about participants' knowledge and time, limitation to 'accepted' topics, assumption of the universal experience of all disabled persons and disregarding of the development application process. Keywords

Geography of Disability, Foucauldian Analysis, Accessibility, Planning Practice and Theory References

Flyvbjerg, B., & Richardson, T. (2002). Planning and Foucault: in search of the dark side of planning theory. Planning

Futures: New Directions for Planning Theory, London and New York: Routledge, 44-62.

Lewis, J. L. (2011). Student attitudes toward impairment: An assessment of passive and active learning methods in urban

planning education. Teaching in higher Education, 16(2), 237-249.

Title: Psychosocial impacts of the lack of access to water and sanitation in low- and middleincome countries: A scoping review

Short Title: A scoping review of psychosocial impacts of water and sanitation **Authors**: Bisung Elijah¹ & Susan J. Elliott²

Authors Affiliation: ^{1,2} Department of Geography and Environmental Management, University of Waterloo, Waterloo, ON, Canada

Abstract: The lack of access to safe water and adequate sanitation has implications for the psychosocial wellbeing of individuals and households. To review the literature on psychosocial impacts, we completed a scoping review of the published literature using Medline, Embase, and Scopus. Thirteen (15) studies met the inclusion criteria and were reviewed in detail. Of the included studies, 6 were conducted in India, 1 in Nepal, 1 in Mexico, 1 in Bolivia, 2 in Ethiopia, 1 in Zimbabwe, 1 in South Africa, and 2 in Kenya. Four interrelated groups of stressors emerged from the review; physical stressors, financial stressors, social stressors, and stressors related to (perceived) inequities. Further, gender differences were observed, with women carrying a disproportionate psychosocial burden. We argue that failure to incorporate psychosocial stressors when estimating the burden or benefits of safe water and sanitation may mask an important driver of health and wellbeing for many households in low- and middle-income countries. We propose further research on water-related stressors with particular attention to unique cultural norms around water and sanitation, short and long term psychosocial outcomes, and individual and collective coping strategies. These may help practitioners better understand cumulative impacts – and mechanisms – for addressing water and sanitation challenges.

Keywords: Water and Sanitation; Psychosocial impacts; Health; Scoping review

Neoliberal Education Policy, Teachers' Professional Autonomy and Union Struggles in Ontario

By Paul Bocking, PhD Candidate Department of Geography, York University

Keywords: neoliberalism, education, scale, unions

I argue that the nature of teachers' work is experiencing a transformation across North America. I will be considering five developments in neoliberal policy and governance that are challenging the

professional autonomy of K-12 teachers, and the responses of educators in the context of Toronto and Ontario. I will be looking at centralization and scalar shifts in authority between the Ministry of Education and the Toronto District School Board, and how these changes have affected workplace power relations between administrators and teachers. I will then assess teacher perspectives on the extent to which standardized testing creates pressure to 'teach to the test', and the impact of specialty magnet programs in a context of declining student enrollment and fiscal austerity. Finally, I look at how the provincial centralization of collective bargaining has upset union strategies while management has become increasingly antagonistic and unified.

TITLE: Collective infrastructure without an anchor: the case of St. Catharines ●IDM industry

Jeff Boggs & Stephanie Murray Department of Geography, Brock University, St. Catharines, Ontario, Canada. jeff.boggs@brocku.ca

ABSTRACT: This case study examines the efficacy of economic development policies in creating an interactive digital media (IDM) hub in St. Catharines, Ontario. Assembled from LinkedIn records, bankruptcy records, newspaper accounts, expert interviews and archival sources, this case study contrasts the bankruptcy of Silicon Knights a video game developer championed as the city's IDM anchor with claims that these policies failed. For instance, existing LinkedIn data indicates that most of the circa 150 employees identified with shipping Silicon Knights' final game have since left St. Catharines for IDM employment elsewhere in Ontario. While this loss of employed talent is a poor outcome from a local economic development perspective, it bodes well for Ontario's IDM industry. Furthermore, during its nearly two decades of operation, Silicon Knights provided a catalyst for the creation of publiclyfunded IDMrelevant collective infrastructure. These included an incubator specialized in providing IDM services throughout Ontario and a video games training program at a local college and university. After the anchor's bankruptcy, a performing arts center and an arts annex of the local university were completed. While it remains to be seen if this collective infrastructure can foster St. Catharines' IDM economy given the anchor's bankruptcy, these investments will likely feed talent into Ontario's larger IDM economy. These findings suggest more generally that evaluating the efficacy of industryspecific and local economic development policies should tease out the temporal and geographical scales at which a policy's benefits should accrue before evaluating the policy's efficacy.

KEY WORDS: anchor firms; industrial policy; video games; local economic development

Debated agronomy: Public discourse and the future of biotechnology policy in Ghana

Joseph A. Braimah, Kilian N. Atuoye, Siera Vercillo*, Carrie Warring, Isaac Luginaah

* Presenter: Siera Vercillo, Doctoral Candidate, Environmental Health and Hazards Lab, Department of Geography, University of Western Ontario

Abstract

This paper examines the highly contested and ongoing biotechnology (Bt) policy-making process in Ghana. We analyze media content using public policy making theory to explain how biotechnology is perceived within the context of Ghana's parliamentary debate about the Plant Breeders Bill. This

paper does not seek to take a position on Bt or the Bill, but to explain how various policy actors influence parliamentary debate by using political and scientific rhetoric in Ghana. The study reveals that in the midst of scientific uncertainties of Bt's potential for sustainable agriculture production and food security, policy decisions that encourage its future adoption are heavily influenced by health, scientific, economic, environmental, and political factors dictated by different ideologies, values and norms. While locally pioneered plant breeding exists in the Ghanaian food chain, seeds from foreign, multinational corporations are strongly resisted by anti-GMO coalitions. Understanding the complex and messy nature of Bt policy making is critical for understanding the future role of technology in the agriculture sector in Ghana and across sub-Saharan Africa.

Keywords: Biotechnology, genetically modified organisms, public policy, content analysis, agriculture, Ghana

The community-based health planning and services and facility-based deliveries in the Upper West Region of Ghana.

Joseph A. Braimah^{1*}, Isaac Luginaah¹ ¹Department of Geography, University of Western Ontario, 1151 Richmond Street, London, ON, Canada, N6A 5C2.

Abstract

Although facility-based deliveries have been widely recommended for the prevention of both maternal and child mortalities by the World Health Organization (WHO), women's autonomy in deciding to utilise these facilities remain low in the Upper West Region (UWR) of Ghana. As part of a larger study, this paper examines the role of the community-based health planning and services (CHPS) initiative in promoting women's decision making autonomy in seeking facility-based deliveries in the region. The study draws from feminist theory as well as Andersen and Davidson behavioural model of health service utilisation to explore how health intervention policies intersect with social, cultural and economic factors to influence women's health care access. Data drawn from a cross sectional survey (n=904) among women with a birth parity in the last five years was analysed using logistic regression techniques. The findings show that women in urban non-CHPS (OR=2.771, *p* < 0.01), urban CHPS (OR=3.430, *p* < 0.001) and rural CHPS zones (OR=1.846, *p* < 0.01) were more likely to be autonomous in deciding to deliver at a health facility compared to their rural non-CHPS counterparts. Also, women's level of education, religion and marital status strongly predicted their decision making autonomy to deliver at the health facility. We argue that the CHPS policy has significantly enhanced women's autonomy to seek facility based deliveries in the UWR of Ghana. The study concludes by making some relevant policy recommendations including expanding the CHPS policy in the region.

Keywords: Community-based health planning and services, facility-based delivery, autonomy

Production in Alternative Agriculture: Understanding labour on certified organic farms in Ontario, Canada

Lucas Bramberger (lbramber@uoguelph.ca), Dr. Evan Fraser (frasere@uoguelph.ca) University of Guelph

presenter

Keywords: Alternative agriculture - Labour - Certified organic - Seasonal Agricultural Worker Program

This research aims to calculate the amount of labour through certified organic agriculture in an attempt to provide values to claims of more labour required through alternative agriculture (Woodhouse, 2010). Current data compares time, area and yields required to meet the dietary requirements of the city of Guelph in the production of tender leafy greens on three different farms in Ontario operating through intern/volunteer labour, paid labour and migrant labour. Further reasoning is based in challenging claims that migrant labour is five times that of a regular worker (Braun, 2016).

Although not five times the level of production, calculations found migrant labour produces most servings over time. Using these calculations with existing census data, it was found that Ontariobased labour in certified organic agriculture could not meet daily demands of vegetable requirements but all agricultural labour, even down to the Wellington region could, in theory. These findings may suggest inquiry into better care and policy through the Seasonal Agricultural Worker Program. Full season and farm-wide production values are to be calculated next as part of this research.

Works Cited

Braun, W. (2016). The lucky struggle. Canadian Mennonite, 20 (14).

Woodhouse, P. (2010). Beyond industrial agriculture? Some questions about farm size, productivity and sustainability. *Journal of Agrarian Change*, *10*(3), 437–453. <u>http://doi.org/10.1111/j.1471-0366.2010.00278.x</u>

Quantifying topography at the landscape level for large reclamation projects

Collin Branton and Derek T. Robinson (Geography and Environmental Management, University of Waterloo)

The importance of topographic fluctuations on understanding natural phenomena is the central tenet of the academic fields of digital terrain analysis and geomorphometry. Wetland ecosystems are an excellent example of a natural system that relies on the surrounding topography and surrounding vegetation. Wetlands have been identified by natural resource managers and policy makers as important ecosystems that should be protected and restored 1) due to the large number of ecosystem services they provide and 2) because they are still experiencing annual loss in total global area. Previous research on wetland restoration focussed on the individual wetland being restored with little attention to integrating the wetland the broader landscape. However, wetland restoration projects need to be focussed on not just the individual sites but also integrating a restored wetland back into the surrounding ecological landscape and reconnecting it to the hydrologic network. Restoration has the goal of returning degraded land back to a stable ecosystem that is functionally similar to the natural ecosystem that existed before the disturbance occurred, which is fundamentally different from reclamation, which has the goal of improving degraded land to facilitate future land use. The presented research seeks to improve our ability to reclaim palustrine wetland landscapes by quantifying topographic characteristics across the landscape within which the reclamation project is situated. Preliminary results of this research will be presented that quantify topography across different natural regions along a gradient of disturbance in a sample of 1 km² landscapes in Alberta, Canada.

Keywords: Terrain Analysis, Wetlands, Restoration, Landscape-scale

Measuring the Economic Impacts of Protected Areas on Nearby Communities

Catharine Brazeau¹

¹ Department of Geography and Environmental Science, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5

* Presenting Author: <u>braz4290@mylaurier.ca</u>

Keywords: conservation; government accountability; sustainable economic development; regional integration

Over ten percent of Canada is presently recognized as protected, and this percentage is expected to grow in upcoming years. Despite this, little is known about the economic impacts Canadian protected areas (PAs) have on communities near their boundaries. This knowledge gap relates in part to the limited attention devoted to instruments for conducting community consultations and economic impact assessments presently available to PA managers. The research presented in this paper examines the use of maps as tools for PA managers to simultaneously assess their impacts and receive feedback from their nearby stakeholders. 27 individuals from municipalities bordering Riding Mountain National Park in Southwestern Manitoba used maps to identify features they perceived to economically impact their area and wellbeing. Maps, in combination with surveys and interviews, allowed most participants to give detailed, location-specific information. With the use of maps, participants' concerns and observations were immediately related to their geographic contexts. This demonstrated the potential mapping holds as a data collection method, both in terms of effectiveness and of creating higher levels of understanding among data analysts. As such, this paper calls for maps to be given further consideration as standardized tools with which protected area agencies conduct community consultations.

Using Knowledge Exchange Strategies to Enhance Research Impact: Lessons Learned from the COMPASS Study

Kristin M. Brown¹; Susan J. Elliott²; Scott T. Leatherdale¹

¹ School of Public Health and Health Systems, University of Waterloo
² Department of Geography and Environmental Management, University of Waterloo

Knowledge exchange strategies, in which researchers interact with end users, provide one way to narrow the gap between research and practice. However, little attention has been paid to evaluating these initiatives. COMPASS is a longitudinal study on student health behaviours in Ontario and Alberta secondary schools, which includes integrated knowledge exchange strategies. Schools receive a customized summary of results annually and are linked with a COMPASS researcher (i.e., knowledge broker) to support them in making changes to improve student health. Knowledge brokering provides an opportunity for researchers to understand what is happening "on the ground" and for schools to learn about evidence-based practices.

This research explored COMPASS researchers' perspectives regarding the role and characteristics of effective knowledge brokers, outcomes of knowledge brokering, and lessons learned. Semi-

structured interviews with COMPASS researchers (n=13) were audio recorded (with permission) and transcribed verbatim for subsequent thematic analysis using NVivo.

The role of COMPASS knowledge brokers included suggesting ideas for school health interventions, connecting schools to community agencies, providing resources and opportunities, and enhancing understanding of study findings. Researchers emphasized the importance of transferable skills (e.g., effective communication), personality traits (e.g., approachability and patience), subject knowledge, and research skills for effective practice. Knowledge brokering had positive impacts on the Compass study, individual researchers, and schools. This presentation will help researchers understand how they can use knowledge exchange strategies to increase research impact by applying lessons learned from the COMPASS study.

Key words: knowledge translation, research impact, school health, qualitative methods

Headphones and Urban Space: Building Soundscapes of Resistance

Brown, S. and Dean, J. (School of Planning, University of Waterloo)

For many urban pedestrians, headphones are a tool for transformation, using mobile audio to remake the repetitious nature of daily routines and patterns of travel. Beyond the obvious enjoyment of personal music that this behaviour allows, this paper conceptualizes headphones as a safety measure for increasing women's sense of security in cities. In this presentation, a new area of theoretical discourse is presented on headphones as a space of resistance in unsafe environments. This area of inquiry is inspired by the work of feminist writer and activist, bell hooks, who demonstrates the power of women to transform their environment through action and perception in order to resist oppression and discrimination. Along with the work on urban headphone use by Michael Bull, this presentation considers headphones a tool for resistance for women who sonically close themselves off to create a protective barrier to unwanted attention and communication in urban environments. While headphones have in part been viewed as destructive to public experiences of space and to overall social cohesiveness, this alternative reading suggests that they can also be an empowering site of resistance for some. A discussion on urban spaces of exclusion and resistance for women is followed by areas for future research in the study of women's headphone use in cities.

Keywords: urban soundscapes, mobile audio, women's urban safety, inclusive cities

The Role of Vascular Plants in N₂O Emissions from Restored Peatlands

Martin E. Brummell(1), Cristina Lazcano(2), Maria Strack(1) (1) University of Waterloo, Waterloo, ON (2) California Polytechnic State University, San Luis Obispo, CA

Keywords: Restoration Ecology, Peatlands, Nitrous Oxide

Restoration of extracted horticultural peatlands commonly includes distribution of vegetation and propagules from nearby undisturbed sites over the recently-exposed surface. The resulting growth

includes both mosses and vascular plants, which are important contributors to returning a peatland to a net carbon-storing ecosystem. The role of N_2O has not been widely investigated in these restored ecosystems. Here we examine the effect on net N_2O emissions from ground to atmosphere of vascular plants relative to non-vascular cover using cottongrass, *Eriophorum vaginatum* at a peatland restored in late 2012 and an adjacent unrestored peatland. We hypothesize that belowground microbial activity would be stimulated by the roots of *E. vaginatum* leading to increased N_2O emissions compared to areas with only moss or bare peat. However, after an early-summer pulse of emitted N_2O , study plots containing *E. vaginatum* transitioned to net consumers of N_2O while bare plots remained sources as the summer progressed. Furthermore, *E. vaginatum* growing in the wettest parts of the study sites also had significantly more extractable nitrogen in pore water collected from 75cm below the surface, beyond the depth of most roots. We suggest the priming effect driven by the roots of this vascular plant, combined with high water levels, frees some nitrogen from previously-inaccessible recalcitrant organic matter that then escapes further microbial decomposition to N_2O or its inorganic precursors and migrates down to regions with limited microbial activity.

"Raising Social Capital for Green Infrastructure: The Role of Civil Society in Greenspace Protection in the Toronto Region"

By Wendy Burton

PhD Graduand (degree to be conferred Nov. 7, 2016)

University of Toronto

Civil society's potential as a force for social innovation has provoked practical and theoretical interest, with its potential largely reliant on the perception that it is a ready if variable source of social capital resources. However, there are no guarantees that civil society will use its social capital for the common good. Civil society encompasses a range of groups, some more inward-looking, others more outward-looking, with the more inward-looking groups oriented to rent-seeking and unlikely to help expand public goods like green infrastructure. This divergent character of civil society was evident in the three campaigns for greenspace protection that eventually led to the creation of the Toronto region Greenbelt, where civil society groups from both growth and conservation camps contended for influence, each succeeding at different times. But over time (a time when state actors were increasingly in need of non-state partners to help solve complex governance problems), coalitions of environmental civil society groups in the three campaigns – to protect the Niagara Escarpment, Oak Ridges Moraine and surrounding countryside – became more effective at influencing government to protect greenspace. A comparison of the coalitions using a framework based on key attributes of civil society groups - inclusiveness and public vs. private interest orientation – suggests that the environmental coalitions were more effective when they recruited more members with a diverse set of resources arising from both bonding and bridging social capital. In general, the more inclusive and public-interested the civil society groups, the more socially innovative the results.

Keywords: greenspace protection, civil society, social capital, environmental governance

Migration, Health and Temporary Foreign Workers: Examining Health and Access to Health Care among Filipina Live-in Caregivers in the Greater Toronto Area, Ontario, Canada

Jessica Carlos¹, Kathi Wilson¹

1. Department of Geography, University of Toronto Mississauga

Immigrants account for 20 percent of Canada's total population with approximately 250,000 individuals immigrating to Canada yearly (Statistics Canada, 2015). Individuals migrate to Canada under various categories with the majority of immigrants migrating under the economic class. The Live-in Caregiver Program (LCP), enacted in 1992, is one of several programs under the economic class of immigration. Despite there being over 80,000 caregivers living in Canada, little to no research has examined the health experiences of this segment of the immigrant population (Kelly et al., 2011). In addition, 90 percent of live-in caregivers are women who have migrated from the Philippines yet we know little about their migration and health experiences. To address this gap in the literature, this research examines how the LCP affects the health of immigrant Filipina caregivers. Twenty-one in-depth interviews were conducted among current and former Filipina caregivers in the Greater Toronto Area. The presentation will focus on perceived impacts of work conditions associated with the LCP on health and access to health services. The findings demonstrate differences in perceived impacts on health and access to care between participants caring for children and those caring for the elderly. Further, the results also demonstrate how working as a live-in caregiver mostly has a negative impact on physical and mental health as well as facilitates and creates barriers to accessing health care services.

Key words: immigration, health, live-in caregivers, Filipina

Integrated community-based disaster risk reduction approach to flood risk management: a good practice project in Ayutthaya, Thailand

Chakraborty, L. (Doctoral Student, Department of Geography and Environmental Management, University of Waterloo)

Among human geographers, enhancing resilience and reducing vulnerability are two common rationales for linking climate change adaptation and disaster risk reduction. Recently, several Asian governments have sought to ground this ideal in practice through an 'integrated community-based disaster risk reduction (ICBDRR)' approach. Based on a fundamental principle of "bottom-up governance", the ICBDRR approach facilitates effective use of local resources and capacities to better prepare communities for disasters, and to reduce their disaster vulnerability. This paper investigates the potential for linking climate change adaptation and disaster risk reduction in the context of flood risk management, drawing lessons from integrated community-based flood risk reduction in Ayutthaya, Thailand. It describes the key instruments of Ayutthaya's ICBDRR approach for flood risk reduction, including a community-based flood early warning network; the creation and dissemination of community flood maps and preparedness manuals; communication of knowledge of flood risk at the local level to build community awareness; collaborative governance; and participatory monitoring and evaluation. The findings of the paper suggest that the integration of climate change adaptation and disaster risk reduction to a greater extent in practice is necessary to support sustainable development in Asia.

Keywords: climate change adaptation, disaster risk reduction, flood risk management, resilience

Culture Shock in the Field: Overcoming Feelings of Isolation in an Unfamiliar Cultural Environment

Author: Cheryl Chan

Culture shock is a theory that describes the stages of adapting to an unfamiliar cultural environment. Societies have norms (i.e., informal guidelines) that dictate the behaviour of its members. Within communities, these norms inform social, cultural, and political interactions. A graduate student conducting research in communities outside of their own can be unfamiliar with

the community dynamics in their new setting, and thus struggle to adapt to the surrounding cultural environment. Difficulties adapting and the associated feelings of isolation and frustration are normal symptoms of culture shock, but the researcher may not anticipate these feelings. When compounded with the day-to-day challenges of living and working in a new environment, the researcher can become disillusioned, emotionally vulnerable, and unmotivated. These are the feelings that I experienced when I conducted my fieldwork in Bluefields, Jamaica, where I studied the social and ecological impacts of a newly implemented marine protected area on surrounding communities. This paper will share the unexpected challenges and associated feelings that I encountered while in the field, and examine the strategies that I used to cope with and adapt to these challenges.

Small Towns in Transition: An Exploratory Study in Collingwood, Ontario

Authors: Sha Chang and Sanjay K. Nepal, Department of Geography and Environmental Management, University of Waterloo

Key words: small towns, economic and social transitions, amenity migration, Collingwood, Ontario **Abstract**

Amenity-rich towns in Ontario are experiencing social and economic transitions, due in part to global shifts in production and consumption patterns. The economic and social transitions exert dramatic influences on local communities' quality of life, social networks, economic dependency, and other aspects of small town living. Many small towns which have seen dramatic decline in their traditional economic bases (e.g., agriculture, fishing, forestry, mining, manufacturing, etc.) have considered transitioning to a service-oriented economy (Mitchell & Randle, 2014; Nepal & Jamal, 2011).

This study examines how Collingwood in Ontario is experiencing economic and social transitions as its economy shifts from its traditional base dependent on construction (ship building) and transportation to one that is gradually oriented toward recreation, tourism and other services (health, retirement residences, public sector employment). We employ a case study methodology to understand changing economic and social dynamics present in Collingwood, and analyze if economic and social transitions are interlinked. The content of this presentation will include an integration of themes including small town change, amenity migrants and second home related influences, and commodification of natural and cultural heritage. Applying quantitative and qualitative methods, and based on two months of fieldwork conducted between July and August, 2016 by the first-named author, preliminary results of the study will be presented to explore the main trends and patterns found in Collingwood.

References

Mitchell, C. J. A., & Randle, K. (2014). Heritage preservation and the "differentiated countryside": Evidence from southern Ontario. *The Canadian Geographer / Le Géographe Canadien*, *58*(4), 429-442. doi:10.1111/cag.12131

Nepal, S. K., & Jamal, T. B. (2011). Resort-induced changes in small mountain communities in British Columbia, Canada. *Mountain Research and Development*, *31*(2), 89-101. doi:10.1659/MRD-JOURNAL-D-10-00095.1

Change Detection from Landsat: 2004 Indonesian Tsunami

Marissa I. Chase and Tarmo K. Remmel

N430 Ross Building, Department of Geography, York University, 4700 Keele Street, Toronto, Ontario, M3J 1P3

Abstract

Studying the effects of a natural disaster can pose challenges if access to potentially dangerous locations is required. Availability of satellite imagery from a variety of periods and that record a breadth of spectral data have the potential to aid the remote detection of changes caused by extreme events while mitigating risks involved with visiting impacted sites. Remote study can improve the delivery of aid and quantify the changes to affected landscapes. We undertook using Landsat 5 images to assess landscape changes resulting from the 2004 tsunami in the Aceh province of Indonesia. Unsupervised classifications of both images were completed using ISODATA analysis to assign pixels into spectral similarity categories and then aggregated into one of eight land cover classes. A post-classification change detection was performed to analyze changes between the two images that provided cross-tabulation of land cover changes and persistence between 21 December 2004 and 27 March 2005. Differences were found in the urban and bare ground classes between the two dates, with a decrease in the urban class from 496 km2 to less than 240 km2, and an increase in bare ground from 501 km2 to 628 km2. There were also changes to vegetated land cover, with 4% of healthy vegetation and 9% of sparse vegetation converted to bare ground. These changes were mapped to produce a spatial representation of land cover change. While this initial investigation identifies regions of land cover change and persistence; results are indicators only given the lack of ground validation.

Keywords

Tsunami, Change Detection, Remote Sensing, Land Cover

The (re)production of nature on natural resource based reality television

By: Kendal Clark, Jennifer J. Silver, and Roberta Hawkins (Department of Geography, University of Guelph, Canada) kendal@uoguelph.ca

The television is a powerful medium through which messages focused on nature and the environment are produced and consumed. In the last ten years, series focused on primary sector activities such as fishing (e.g., Deadliest Catch), mining (e.g., Yukon Gold), and forestry (e.g., American Loggers) have been ratings hits for television networks Discovery and The National Geographic Channel. Understanding *what* images and messages about nature these series convey, and *how* and *why* they do so is pressing. So too is building appreciation for *what effects* the (re)production of nature through reality television may have over time.

This paper examines natural resource based reality television as a new iteration in the (re)production of nature on television and critically analyzes how this genre mediates humanenvironment relations. A sample of 100 episodes across a total of 15 different series that aired on Discovery Channel, or The National Geographic Channel between 2005-2016 were critically analyzed. In combination with data collected through the execution of two focus groups, this discourse analysis reveals that masculinities, nationalism, and the commodification of nature are prominent themes that intersect to mediate human-environment relations. This research highlights the need for more critical analysis of the effects that the proliferation of nature resourced based reality television has on public narratives surrounding human-environment relations.

Keywords: Human-environment; Media Geographies; Television; Gender

Consultants and Convergence of Economic Development Policy in Ontario, Canada

Evan Cleave, Department of Geography, University of Western Ontario Merlin Chetwood, Department of Geography, University of Western Ontario Godwin Arku, Department of Geography, University of Western Ontario

Over the past two decades, local governments have increasingly outsourcing policy advisory and development to private-sector consultants. The common refrain for the use of consultants is that they fill gaps in the knowledge, skill, and capacity missing within local governments. The use of consultants, however, has been criticized promoting policy homogenization and promoting fast policy solutions. This criticism is particularly relevant in local economic development policymaking, where unique, place-based solutions require in-depth local knowledge are needed. To understand the role of consultants in economic development, this study critically examined the design and content of the primary economic development policy documents for 41 cities in the Province of Ontario (ten cities currently do not have a policy document). The findings of this study indicate that consultants are heavily used, as they were involved with the development of two-thirds (26/41) of the policy documents examined. There is an oligarchic pattern of consultant use, as a handful of consultants were responsible for the 26 documents. From a qualitative perspective, this led to policy documents that were similar in style, scope, and reused specific language. From a policy perspective, this has led to a convergence of policy as the documents recommend cities continually use the same approaches. Local economic development requires specific place-based knowledge to tailor policy correctly, and the constant use of external consultants is counter-productive as they do not provide policy that can differentiate one city from its competitors.

Keywords: Policy, Consultants, Local Economic Development, Cities

Title: Energy, water and carbon fluxes from a constructed boreal wetland

Authors:

Clark, M. Graham (Presenter), Carleton University

Humphreys, Elyn, Carleton University

Cary, Sean, McMaster University

Abstract:

The Sandhill Fen Watershed project is a pilot study involving the construction of a 50 ha mixed upland (forested) and lowland (wetland) watershed on top of an infilled open pit mine in northern Alberta. The project is one of the first large scale attempts in constructing a boreal wetland. The physical construction was completed in 2012 with the initial re-vegetative seeding and planting occurring in the same year. In 2013 pumps were used to simulate ground water through-flow and in 2014 and 2015 the pumps were disengaged to allow the system to naturally respond. Throughout this period the vegetation has developed a substantial cover over the

reclaimed soil and peat. An eddy covariance system was used to calculate the ecosystem level fluxes over the three years since wetting. In 2013 there was a net loss of carbon from the lowland regions but by 2014 the carbon balance was almost neutral and in 2015 it was a net gain. Evapotranspiration from the ecosystem also increased over the same period. However, methane production continues to be well below what would be expected for continuously saturated organic substrates. PRS probes and chamber gas measurements show a trend of increasing methane fluxes with increasing metal ion fluxes and decreasing fluxes of sulphate in the continually submerged regions. Therefore, it is likely that naturally occurring high levels of sulphate within the substrates are suppressing the methane fluxes in this novel boreal lowland ecosystem.

<u>Ethno-Cultural Organizations and Local Immigration Partnerships: A Match Made in Heaven?</u> <u>A Case Study from Durham Region, Ontario</u>

Blair Cullen.

(Department of Geography and Environmental Studies, Wilfrid Laurier University)

Ethno-cultural organizations are a fundamental part of the newcomer settlement process. Socially, culturally, economically and politically, their role has been well documented. What is less known about ethno-cultural organizations is their role in local settlement policy. To a certain extent, this is understandable. Historically, Immigration, Refugees and Citizenship Canada (IRCC), has lacked any type of formal settlement policy, leaving haphazard local frameworks and little opportunity to explore ethno-cultural organization's place. Introduced in 2008, as part of the *Canada-Ontario Immigration Agreement*, Local Immigration Partnerships (LIPs) are IRCC's first attempt at coordinated local settlement policy, setting a new direction by restructuring local settlement models. Objectives were designed to examine ethno-cultural organizations relationship with LIPs, in the context of Durham Region's LIP, based on interviews with 52 key informants in eight sectors involved in immigrant settlement. Results from the case study revealed ethno-cultural organizations to have among the least developed relationships with Durham's LIP. Considering the LIPs mandate of settlement, this seems like an oversight. However, a closer examination suggests, this may simply be the outcome of a place-based policy, in a policy area where a long-standing policy-vacuum has created a highly localized settlement model. With much of the literature centered on ethno-cultural organizations as it relates to specific ethnic communities and primarily based in first-tier cities, the research seeks to shift the unit and place of analysis, while contributing to a limited empirical understanding of LIPs impact.

Keywords: Place, Second-Tier Cities, Immigration, Local Settlement Policy

Title:

Characterizing China's transition pathways towards organic agriculture: a niche level case study in Nanjing, China

Name and affiliation:

Ning Dai PhD candidate University of Waterloo

Abstract:

In comparison to the energy and transportation sector, the sustainable transition of agro-food systems in China is understudied. Recently organic agriculture picked up momentum in China and has been incrementally shifting the national food landscape towards a more sustainable status. During this sustainable transition of agro-food systems, organic farmers play important roles. Farmers are the niche actors that create and absorb novelties in farming theories. techniques, management and marketing. Farmers' learning ability, social networks, and interactions with structural actors influence the viability of the niche developments. To analyze farmers' engagement with the sustainable transition of food systems, this paper employs the conceptual frameworks in transition studies and adopts the multi-level perspective to uncover the strategies and impacts of niche actors. More specifically drawing on the interview data with organic farmers in Nanjing China, this study discusses: 1) farmers' incentives and expectations to enter the organic sector; 2) learning process and adaptive mechanisms 3) interactions with regime actors. Regime actors refer to the co-evolutionary social subsystems that contextualize farmers' decision making, including governmental networks, rural societies, ecological systems and technical dynamics. By revealing the interplay between farmers and the complex web of regime actors, the paper adopts an integrated viewpoint to conceptualize the transition patterns captured during field research and contributes to the debates on China's trajectory to agroclimatic sustainability.

Keywords:

Organic agriculture; niche actors; sustainable transition; China

Title of paper: Global Migration and Chronic Inflammatory Diseases: Examining Health Literacy among South Asian Populations

Authors: Dr. Ivy Dam Postdoctoral Fellow Department of Geography University of Toronto Mississauga T: +1 (647) 503-2706 ivy.dam@utoronto.ca

Gurveer Bains Doctor of Philosophy Student Department of Geography University of Toronto Mississauga gurveer.bains@alum.utoronto.ca Dr. Kathi Wilson Professor and Chair Department of Geography University of Toronto Mississauga T: +1 (905) 828-3864 F: +1 (905) 828-5273 kathi.wilson@utoronto.ca

Global migration of human populations is occurring at an unprecedented rate throughout the world, yet we do not fully understand how migration impacts health and disease development. In particular, the effect of human migration patterns on the incidences of chronic inflammatory disease (CID) is not well appreciated. Research has shown that children of South Asian migrants born and living in Canada and other 'Western' countries have a significant, yet unexplained increase in the risk of developing a CID, especially type 1 diabetes, multiple sclerosis, and inflammatory bowel disease. While the South Asian community represents a significant and growing population in the Greater Toronto Area (GTA), totaling approximately 700,000 individuals, understandings of health literacy, health beliefs, health-seeking behaviours, and healthcare needs within this community are still not well understood. This research examines health literacy and access to health care services among 1st and 2nd generation South Asian Canadians living in the GTA, who have and have not been affected by CIDs. In-depth interviews were conducted with 21 individuals who migrated from South Asia and 44 individuals born in Canada to a South Asian-born parent. The interviews reveal that most participants are not familiar with CIDs, in terms of their awareness and knowledge of definitions, examples of diseases, and family and friends who have been affected by CIDs. The majority perceive that increased prevalence may be related to change in diet, physical environment, genetics, and stress.

Keywords: health literacy, South Asian Canadian immigrants; chronic inflammatory disease; migration

The title of the paper:

The importance of soil properties for tree seedling growth and survival beyond alpine treelines

The name(s) and affiliation(s) of the author(s):

Emma L. Davis ¹, Dr. Ze'ev Gedalof ¹, Dr. Heather Hager ²

¹ University of Guelph, Department of Geography

² University of Guelph, Department of Integrative Biology

A 250-word (maximum) abstract:

Climate change is causing significant changes to species distributions worldwide. Plants growing at the edges of their existing range limits are expected to be particularly sensitive to changes in temperature and precipitation regimes; however, the importance of non-climatic factors as constraints to range expansions is increasingly being recognized. This study presents the results of a growth chamber and glasshouse experiment that assessed the effects of soil provenance on tree seedling germination, growth, and survival. Seeds of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*abies lasiocarpa*) were sown in soil collected across four treeline environments in western Canada and grown in a growth chamber for 90 days. By controlling seed source and climatic conditions, we are able to attribute differences in seedling performance to soil properties that differ across elevation zones and individual treeline sites. Our results indicate that soil provenance can act as a constraint to tree seedling germination and height; soils originating from beyond the species' range were the least amenable to seedling growth overall. The findings of our research indicate that predictions of future tree species' distributions under climate change scenarios should incorporate non-climatic factors that may limit tree recruitment beyond current species' ranges.

Up to 4 keywords

Soil, trees, alpine environments

Exploring the resilience of households in the Amazon estuary; an agent based simulation.

Peter Deadman Department of Geography and Environmental Management University of Waterloo Waterloo, ON, N2L 3G1

Yue Dou, Center for Systems Integration and Sustainability Michigan State University East Lansing, MI 48823, USA

Abstract

Rural-Urban networks are becoming increasingly important in the Amazon estuary. Rural households in this region are frequently multi-sited, maintaining a dwelling both at the farm and in a nearby city. These networks facilitate the movement of people back and forth between the farm and the city for the purposes of education, moving goods to market, participating in government financial programs, or participating in urban off-farm employment. Non-farm income has become an important component of household livelihoods in this region. However, migration to urban areas can also result in a reduced labour force in agricultural areas, with associated reductions in food security and traditional agricultural knowledge. This study utilizes an agent based model to explore the impact of urban off-farm activities on the resilience of agricultural communities in the face of changing environmental and economic conditions. An agent based simulation, parameterized with data from a household survey conducted in the region, is utilized to explore a number of scenarios in which the resilience of rural agricultural communities is evaluated in the face of external shocks. These household's activities, both on the farm and in the city, determine how they respond to these shocks. The contribution of urban activities such as education, employment, and government cash

transfer programs to the response and resilience of these multi-sited households is examined and discussed.

Thinking relationally about built environments and physical activity: A study of adult walking behavior in Waterloo, Ontario

Jennifer Dean, PhD (School of Planning, UW); Michael Drescher; Jeff Casello; Anna Garnett; and Troy Glover

The relationship between built environments and physical activity levels has constituted a rapidly emerging field of research in the past two decades. Of note is the consistent finding that neighbourhood walkability is positively correlated with utilitarian and recreational physical activity patterns. Indeed, academics and practitioners alike have emphasized the imperative of designing environments that are conducive to active transportation. However, much of the work in this area has approached the relationship between built form and physical activity from a deterministic perspective that predominantly focuses on objectively-defined neighbourhood characteristics and singular time-space patterns. Using a mixed-methods case study design, this research examined the activity patterns and experiences of walking among adults in Waterloo, Ontario. The findings suggest that the decision to walk, and the specific travel route chosen are influenced by both objective and subjective neighbourhood characteristics. Further, these travel choices are dependent on changing temporal and spatial constraints of participants and challenge the dominant rational choice explanation described in the literature. This presentation concludes with the recommendation that future research and policy utilize a relational perspective when considering the relationship between built environments and physical activity. Such a perspective will better capture the dynamics between people and place, and ultimately guide practitioners on how to design built environments that accommodate the realities of human activity in general and walking behavior in particular.

Keywords: built environment; active transportation; social theory; mixed-methods

"Rundown by the wolf: exploring the relationship between gender and economic marginalization for Canadians with Systemic Lupus Erythematosus (SLE)"

Jenna Dixon^{*1}, Susan J. Elliott¹ & Ann E. Clarke²

¹ Department of Geography and Environmental Management, University of Waterloo

² Cumming School of Medicine, University of Calgary

*Corresponding author: jenna.dixon@uwaterloo.ca

This paper contributes to the nascent but growing body of work within health geography investigating the social, and specifically gendered, dimensions of chronic disease. Systemic lupus erythematosus (SLE) is a chronic autoimmune disease which disproportionately impacts young (15-40 years), non-white women. SLE has no known cause or cure, and diagnosis is often a difficult and drawn-out process. There is a wide expression of long-term morbidity with SLE but the disease usually manifests with severe fatigue, debilitating pain and periodic flares, making participation in the paid workforce extremely challenging. We conducted semi structured in-depth interviews with

8 Canadian key informants and 28 Canadian SLE patients (26 women) to improve understanding of the direct and indirect costs associated with SLE. This presentation explores the economic implications of this chronic disease through a gendered lens. Our findings reveal the early and yet ambiguous manifestation of the disease significantly rerouted the course of participants' economic livelihoods, often to part-time precarious employment and in some cases to leave the workforce all together. These economic and health impacts were further compounded by a lack of health benefits and poor provincial health coverage for preventative care, leading to additional out-of-pocket expenses. While many participants reflected that there was little their employers could have done to further accommodate their needs, we argue that there are structural challenges within Canada which economically marginalize women with SLE and impact access to resources for promoting healthy lifestyles and disease management.

Keywords: Chronic Disease, Gender, Marginalization, Economic inequity

Modelling Urban Snow Melt in Waterloo, Ontario

Paul Donchenko and Richard Kelly Department of Geography and Environmental Management University of Waterloo

Understanding the processes of urban snow melt is critical for city water resources planning, especially when it can be responsible for flooding (Buttle & Xu, 1998) and transport of pollutants into water bodies (Kim and Kannan, 2007). This research adapts the Urban Snow Model (USM) developed by Ho and Valeo (2004) to simulate snow melt runoff from various natural environmental factors, as well as human interactions like snow redistribution. The model was adapted for the Claire Creek catchment in Waterloo to predict hourly runoff for a four day period in January 2015. Initial, uncalibrated model runs produced large errors compared with the observed runoff. Nash-Sutcliffe efficiency and root mean squared error metrics were used to optimize the model, particularly through a phase scaling approach. The adjusted results showed improvements but could not predict events outside the first 80 hours of the study period; runoff timing could be predicted accurately but peak flow and total event volume had significant error. The model's snow redistribution operations were found to have the greatest impact on runoff results and were necessary to produce the same temporal variability found in observed runoff. Without further recalibration, the model is infeasible for simulating runoff in the Claire Creek catchment, which is very different in character compared with the original study site. Future work should reduce the catchment size and install local instrumentation. Furthermore, the model should be subjected to a full sensitivity analysis and explore geospatial techniques to model water flowpaths and timings through the catchment.

Keywords: urban, snowmelt, modelling, hydrology

The best strategy to cope with crop price shock—a case study using agent-based model

Yue Dou (Presenter), Peter Deadman, Marta Berbes, Derek Robinson, Dawn Parker - University of Waterloo

<u>Abstract</u>: Increasing risks from climate change, economic recession, and political insatiability faced by many of the world's most poor and vulnerable populations, have led scientists and decision makers in recent years to investigate the concept of "resilience" thus to guide policy making.

Caboclos are small farming households in the Brazilian Amazon estuary region who have been facing the increasing extreme climatic events in extent and frequency over recent decades. These climatic threats, along with market oscillations, make it urgent for scientists to evaluate strategies to enhance Caboclos' resilience to deal with the future risks. Agent-based modeling (ABM) is a widely used tool to explore the dynamics of coupled human-environment systems. This study utilizes an agent-based model to represent a community of 21 households in a theoretical landscape with upland and floodplain. A shock that represents the sudden price drop of a cash commodity Acai (a berry that has been labeled as "energy food" in the North America) is fed to the model, and three livelihood strategies are simulated to demonstrate the different responses to the shock. We follow the "development resilience" concept, which is the capacity to avoid poverty when there are different shocks, to frame our analysis and to evaluate the most resilient strategy. Our results can be used to guide smallholders in Amazon delta and other similar regions to adopt the most resilient strategies for environmental and market uncertainties

Production Logic of Well-Being: Considering the Non-Economic Factors of Agritourism Production in Southern Ontario

By: Susan Dupej, Western University

The purpose of this presentation is to present research findings from a study that investigated agritourism production in Southern Ontario as a culturally informed process concerned with home and family, individual utility, self-worth, and well-being for the farmer. Agritourism is well-known as an economic diversification strategy but needs to be better understood as a cultural practice involving the social relations and everyday interactions of individual 'life contexts'. I draw from the experiences of agritourism operators to show there is a logic to agritourism production that allows farmers to achieve a sense of well-being by involving family and friends, strengthening spousal relationships, and emotionally connecting to the work. I argue that these are all forms of production not necessarily driven by profit but by the embodied doings of day-to-day tasks that keep the destination running in the long term.

Key Words: agritourism; tourism; non-economic; production

Title: Quantifying and Mapping Soil Erosion in the Grand River Watershed

Omar Dzinic, Benjamin Meinen, Caroline Kayko, Jack Su, and Derek T. Robinson Keywords: Soil Erosion, RUSLE, SPI, Grand River

Erosion is a major environmental problem responsible for massive economic losses and pollution of water sources in the developed world and developing nations. The eroded soil in agriculturally dominated landscapes is typically nutrient rich topsoil, abundant in nitrates and phosphates, which is transferred into nearby streams and can lead to eutrophication in local and national water sources. Two of the most widely used approaches for estimating and modelling erosion are the revised universal soil loss equation (RUSLE), which is used for estimating sheet erosion, and the stream power index (SPI), which is used for modelling gully erosion. Despite the widespread use of these tools they have rarely been combined to identify areas prone to high erosion. The presented research combines RUSLE for applications in Canada (FAC) and the SPI to quantify and map soil erosion in the Upper Nith, a subbasin of the Grand River watershed in Ontario, Canada. We identify and rank catchments within the sub-basin based on estimated erosion values. We then interrogate the top three catchments to further locate the exact sources of erosion. Overall, the most highly

erosive areas were located in the southwest portion of the Upper Nith sub-basin. The highest amounts of sheet and rill erosion were 22.38 t/ha/yr in

Silver Creek, 17.65 t/ha/yr in Bamberg Creek, and 15.20 t/ha/yr in Firella Creek. These and other findings that will be presented help target high-priority areas for mitigating erosion that can be used by initiatives like the Government of Canada's Great Lakes Water Quality Agreement.

Abandoned Oil Well-Pad Peatland Reclamation

Ali Engering, Maria Strack, Bin Xu and Melanie Bird

email:aengerin@uwaterloo.ca

Keywords: Peatland, Oil well-pad, Reclamation, Carbon Exchange

In-situ oil sands production industry has impacted over 140,000 km² of land in Alberta. Roughly 16% of Alberta is covered in peatlands that have the potential to sequester as well as emit globally significant amounts of carbon, yet little research has been done on the restoration of peatlands previously used as oil well-pads. In this restoration experiment, three different civil earthwork treatments (CET) based on inversion of clay (used in well-pad construction), peat and a mixture of clay and peat, were implemented on an abandoned well-pad near Peace River, Alberta in 2009. Each CET (mixed, clay and peat) was split into three experimental blocks. One experimental block was revegetated with donor material dominated by Sphagnum and one with brown moss. All treatments were then covered in straw mulch. The site's restoration treatments were assessed for carbon fluxes in the second and third growing seasons post-restoration. Carbon dioxide (CO₂) and methane (CH₄) fluxes were measured in a full factorial design of CET and revegetation treatments in 2014 and 2015 using the closed chamber technique. The brown moss treatment emitted the least CO₂ and had the least Gross Ecosystem Productivity (GEP). There were no significant differences in CH₄ by revegetation treatments or CETs. There was no significant difference in CO₂ fluxes between peat and clay CET. Both GEP and net CO₂ uptake increased marginally from 2014 to 2015, while CH4 emissions remained similar. Future research on carbon emissions is needed to further understand the restoration potential of these different CETs.

Lyme Disease and Deforestation: A realist systematic review By P.M. Enright¹

¹ PhD Candidate – Department of Geography and Environmental Management University of Waterloo Waterloo, Ontario

Keywords: Lyme Disease, Forest Fragmentation, Deforestation, Systematic Review

Abstract: In world characterized by increasing environmental change at local, regional, and global levels concern has arose regarding the seemingly perpetual loss of biodiversity we are experiencing. In relation to this concern are increased fears that this loss of biodiversity may result in an increased prevalence of zoonotic diseases in the environment and an increased transmission of such diseases to humans. One such disease causing increasing concern is Lyme disease and its associated bacterium Borrelia burgdorferi. This study seeks to determine, through the construction of a realist systematic review, any relationship between factors associated with biodiversity loss, deforestation and/or forest fragmentation and any associated habitat fragmentation and an increase in prevalence of B.

burgdorferi in either human populations or the natural environment. This systematic review utilised both the PubMed and Web of Science databases to eventually select and analyse 14 articles that met the review's inclusion criteria: that they were written in English and studied a relationship between the prevalence of Lyme (or B. burgdorferi) in human populations or the natural environment and deforestation and/or forest fragmentation. This review determined that there is a relationship between the prevalence of B. burgdorferi and deforestation and/or forest fragmentation but that this relationship is dependent on specific conditions, such as forest patch size, the percentage of woodlandopen space borders in an area and the landscape type of lands next to forest patches. This review concludes by offering recommendations for both policy and research that may help protect human populations from the disease.

Managing Trade-Offs in Canadian Fisheries and Fisheries Research Author: Graham Epstein

There is a large and growing consensus among scholars and fisheries authorities regarding the need to account for the impacts of fishing on marine ecosystems. Fishing for forage species such as shrimp can, for instance, have a significant impact on the structure and function of the marine ecosystem as a result of interactions with fishing gear, habitat alteration and/or trophic cascades. However, implementation of policies premised on an ecosystem-based approach present significant challenges for policymakers because of their tendency to produce trade-offs that benefit some stakeholders at the expense of others. This preliminary research project therefore investigated how social networks, political efficacy and economic incentives affect the attitudes of shrimp fishers towards policies designed to limit the ecosystem impacts on shrimp fishing. This research on the management of trade-offs provides some initial support for each of these hypotheses, but also presented a number of moral trade-offs for the researchers involved. Fishers often expressed a belief that our research would or at least could help them to achieve some of their collective goals, providing a major motivation for them to participate. Similarly, efforts on my part to maximize the number of completed surveys placed members of the research team in uncomfortable situations.

Developing baseline knowledge of water and metals supplied by the Peace River to the Peace-Athabasca Delta, northern Alberta, using paleolimnology

Faber¹ J., T. Owca¹, R.I. Hall² and B.B. Wolfe¹

¹Department of Geography and Environmental Studies, Wilfrid Laurier University, Waterloo ON ²Department of Biology, University of Waterloo, Waterloo ON

The Peace-Athabasca Delta (PAD) is a large boreal freshwater delta containing hundreds of shallow lakes that provide important wildlife habitat and is internationally recognized (UNESCO World Heritage Site, Ramsar Wetland of International Importance) for its ecological, historical and cultural significance. Concerns over lake water quantity and water quality stem from multiple potential stressors on the PAD, including past and current construction of hydroelectric dams on the Peace River, upstream oil sands development, and climate change. Along the Peace River, concerns have been heightened by recent approval of BC Hydro's proposed Site C Dam. Here we use paleolimnological approaches to further enhance knowledge of baseline hydrological conditions of the Peace River, in advance of Site C Dam operation, and to also characterize the natural supply of metals to the PAD via the Peace River for broader assessments of the effects of oil sands development. During summer 2016, ~35-60-cm long sediment cores were obtained using a

hammer-driven gravity corer from four lakes along the Peace and Slave river floodplains in the vicinity of the PAD. Sediment cores were described and sectioned at 1-cm intervals. Sediment subsamples will be analyzed for radiometric (¹³⁷Cs, ²¹⁰Pb), physical (loss-on-ignition), and geochemical (organic carbon and nitrogen elemental and isotope composition, cellulose oxygen isotope composition, metal concentrations) parameters and biota (diatoms, pigments) to reconstruct past hydrological conditions and metal deposition. Findings will be of interest to multiple stakeholders and will inform stewardship of the delta.

Key words: Peace-Athabasca Delta, multiple stressors, paleolimnology, baseline conditions

Dendroglaciological investigations at Klinaklini Glacier, British Columbia Coast Mountains

Lauren Farmer and <u>Dan J. Smith</u>, University of Victoria Tree-Ring Laboratory, Department of Geography, University of Victoria, Victoria, British Columbia V8W 3P5 (<u>smith@uvic.ca</u>)

Flowing southward 35 km from the Ha-Iltzuk Icefield, the Klinaklini Glacier is the largest glacier (470 km2) located entirely within British Columbia. From 1949 to 2009, the glacier lost approximately 10% of its area and experienced significant downwasting. Despite the potential for deriving significant insights into Holocene glacier activity from this recently deglaciated landscape, only a single salvage survey in 1977-1978 of glacier-killed trees describing an early Little Ice Age advance has been undertaken. Based on discoveries at nearby glaciers and insightful descriptions by Munday (1936) of glacier-killed tree debris in till at Klinaklini Glacier, a dendroglaciological survey of the lateral moraines flanking the glacier was completed in July, 2016. Radiocarbon dating of wood remains show that Klinaklini Glacier expanded into standing forests at ca. 3600, 1400, 1000 and 600 cal AD. These advances coincide closely in time with previously recognized glacier activity in the Mt Waddington area and with the Late Holocene history of other glaciers in the Pacific Ranges. The findings emphasize the substantial mass balance and size changes experienced by glaciers within the southern British Columbia Coast Mountains over the last 4000 years.

glacier, tree-rings, Holocene, British Columbia Coast Mountains

Comparing Sediment Contaminant Concentrations in the St. Clair Detroit-River System

K. Wayne Forsythe, Ryerson University Danielle E. Mitchell, Ryerson University Richard R. Shaker, Ryerson University Stephen J. Swales, Ryerson University Joseph M. Aversa, Ryerson University Daniel J. Jakubek, Ryerson University

Sediment core samples have been collected and analyzed for metallic and organic contaminants under the Environment Canada Great Lakes Sediment Quality Assessment Program since the 1960's. This paper compares methods for the visualization and presentation of the data using traditional dot maps, two-dimensional kriging and a three-dimensional kriging/bathymetry overlay method. Data for Lake St. Clair were obtained for 1970, 1974 and 2001. Additional data samples for the lake and the St. Clair and Detroit Rivers were acquired for 2014. Dot maps for all of the datasets were produced with ArcGIS software. In addition, the ordinary kriging geospatial analysis

technique was used to generate area estimates of contamination. Finally, bathymetry data were utilized to produce three-dimensional draped representations of the mapped results. Proximity to traditional industrial areas appears to affect contaminant distribution relationships. This information is especially valuable when it is combined with knowledge of spatial patterns that are derived using geospatial interpolation techniques. Bathymetry data further enhance the mapping of observed pollution patterns when they are included in the analyses.

Key words:

Ordinary Kriging; Visualization, Bathymetry; Sediment Contamination

Spatial use patterns in three income-differentiated Hamilton(ON) Census Tracts

Milton J. Friesen, Ph.D. (Cand) University of Waterloo, School of Planning

Global Positioning System (GPS) data is collected from randomly recruited participants across three income-differentiated Census Tracts in East Hamilton. The 2.1 x 10⁶ observations were made at 15 second intervals over a seven day period and are spread across a total of 97 participants divided among the three Census Tracts. Data was collected between January and March (2016) via GPS travel logging devices that logged time, date, longitude, latitude, elevation and speed. Participants also filled in travel diaries for the week to determine the degree to which the data collection period could be charaterized as normal. The research explores how income patterns lead to differences in local travel patterns using ten empirical measures such as length of path, standard spatial deviation, directional ellipsis, and differences between mean and median spatial averages. These spatial measures are part of a more extensive study that also measures and compares social capital levels of the same participants using a new social capital instrument that measures social networks and levels of trust. Two primary spatial clusters are evident in the higher income Census Tract while across all three Census Tracts street patterns appear to have a greater effect on directional travel patterns than income.

Keywords: Global Positioning System, spatial statistics, neighbourhood spatial patterns

FEASIBILITY AND PRELIMINARY RESULTS OF USING MECAHNICAL COMPRESSION TO ACCELERATE THE RETURN OF HYDROLOGICAL FUNCTION TO RESTORED CUTOVER PEATLANDS

Tasha-Leigh Gauthier*, Dr. Colin McCarter, Dr. Jonathan Price

Abstract

Ten years post-restoration at the Bois-des-Bel peatland (BdB) there was limited hydrological connectivity between the regenerated *Sphagnum* moss and the remnant cutover peat due to the formation of a capillary barrier. This resulted in lower soil water content and decreased productivity of the regenerated *Sphagnum* moss compared to a natural analogue. This study evaluates the feasibility of mechanical compression of the regenerated *Sphagnum* moss to ameliorate the capillary barrier effect. Hydraulic conductivity-soil water content relationships were

determined for non-compressed and compressed cores of regenerated *Sphagnum* moss (n=5 cores of 4 depths). The resulting data was used to parameterize a Hydrus-1D model to further elucidate the effect of compression on the hydraulic properties of the regenerated *Sphagnum* moss. Samples were compressed by an average of 1.3 cm which resulted in an increase in bulk density by 49% across all samples and an increase in average unsaturated hydraulic conductivity at each pressure step. Volumetric moisture content increased by 0.10, 0.09, and 0.08 at ψ = -5 cm, -15, and -25, respectively, while at ψ = -10 cm θ decreased by -0.04. These results indicate that compression will likely increase hydrological connectivity to the surface and decrease hydrological stress on the moss, and so field level investigation as a restoration technique was undertaken. In January 2016, two fields of the BdB were compressed using a John Deere 6430 Series tractor. Initial measurements of moss height showed 59% compression before rebound. Preliminary moss height after rebound and hydrological response to compression from summer 2016 will be presented.

Key words: peatland restoration, mechanical compression, capillary barrier, sphagnum moss

Title: Embedded or Disembedded?: High-tech urban approaches to food system sustainability

Name: Alesandros Glaro

Keywords: Zfarming, Urban Agriculture, Ecosocialism, Entrepreneurship

Local food systems are popularly claimed as a solution to better connect consumers to producers in a rapidly urbanizing world. There exists, however, a skepticism as to what degree these generally smaller-scale local schemes can entrench producer-consumer linkages across larger cities. Entrepreneurs have only recently challenged this doubt, as seen by steady technological innovation to create larger-scale commercial urban farms. Though a great deal of literature exists regarding the social, economic, and environmental impacts of scaling-up these high-tech strategies, it remains relatively unexamined if society may become better connected to food production through this transition: a key narrative in the local food movement. This research gap is especially pertinent in a Canadian context, where ideas of tech-intensive food entrepreneurship are just beginning to take hold. In this paper I explore theoretical literature regarding socio-natural relations, in order to contextualize high-tech urban agriculture transitions within broader understandings of sustainable transition. I also describe methodologies to examine this phenomenon, including the theoretical lens of ecosocialism as well as interviews of key urban agriculture stakeholders. High-tech urban agriculture is increasingly gaining traction in cities around the world; it is vital to critically examine this positive narrative of re-embedding food within cities through technology, especially in Canada where these business models are just beginning to grow. In conclusion, by examining high-tech urban agriculture within a theoretical as well as an applied context, this paper sheds light on the possible implications of high-tech urban agriculture on socio-natural relationships in Canadian cities.
An Analysis of Decision Making among Atlantic Lobster Harvester Groups

Larissa Goshulak^{*}, Dr. Jennifer Silver, and Dr. Benjamin Bradshaw Department of Geography, University of Guelph *lgoshula@uoguelph.ca

<u>Abstract</u>

In response to widespread demands for market-based seafood governance mechanisms, third-party seafood certifications have emerged and begun to gain recognition from actors along sustainable seafood supply chains [1,2]. Despite the promise of seafood certifications, the effectiveness of these initiatives is threatened by the proliferation of certification alternatives by different organizations (e.g. Marine Stewardship Council, Ocean Wise, Friend of the Sea). Consequently, the sustainable seafood market may now be oversaturated with alternatives to a point that confuses producers and consumers alike, and fish harvesters may therefore not be adequately rewarded for their sustainability efforts [3]. This research aims to understand the strategies that lobster harvester organizations on the east coast of North America use when navigating this complex seafood certification landscape, and to assess the relationship between these strategies and complex seafood supply chains. Through semi-structured interviews with representatives of lobster harvester organizations and other industry professionals, the research explores how these groups engage in certification processes and respond to the pressures and conditions that shape certification and market demands for sustainable seafood. Based on preliminary research and discussions with interview participants, it seems that the role of the harvester group in selecting the most suitable certification may be constrained by the demands of the retailer and the international seafood marketplace. Furthermore, this research hypothesizes that the role of certification in the sustainable seafood industry is evolving, as certification is increasingly seen as a tool for market access rather than a tool for sustainability. Key words: seafood, certification, lobster, Marine Stewardship Council

References

- Foley, P. (2013). National Government Responses to Marine Stewardship Council (MSC) Fisheries Certification: Insights from Atlantic Canada. *New Political Economy*, 18(2), 284–307. http://doi.org/10.1080/13563467.2012.684212
- [2] Schrank, W. E. (2005). The Newfoundland fishery: ten years after the moratorium. *Marine Policy*, 29(5), 407–420. http://doi.org/10.1016/j.marpol.2004.06.005
- [3] Foley, P., & Hébert, K. (2013). Alternative regimes of transnational environmental certification: Governance, marketization, and place in Alaska's salmon fisheries. *Environment and Planning* A, 45(11), 2734–2751. H

Lessons from the past: Why we should not overlook social transformation trends following resource booms

Halima Goumandakoye Department of Geography, University of Western Ontario

Oil discoveries and production are often linked to dependence, loss of competitiveness, inequality and corruption (Auty 1998, Sachs and Warner 2001, Papyrakis and Gulagh, 2004). Initial debates on the extractive industries in the developing world focussed on the Dutch disease and the resource

curse. However, with globalization and climate change, attention has now shifted to corporate social responsibility (CSR), inclusive development and the scramble for natural resource. Today an array of oil, gas and mining multinationals have set their sights on "unconventional", hard to extract resources in surprising and at times controversial new places. This paper stresses the importance of studying social transformation following a resource boom, drawing upon the Niger case by looking at the oil industry's interaction with local communities in Niger's Zinder department. Niger qualifies as one of those new, "unconventional" or even risky oil partners. From its extensive four decades' experience with uranium mining, soon after the first barrels out of its refinery, questions were already raised by civil society. Leading many to question the extent of oil's role as a vector for development. Despite the importance of human and social frameworks, the literature on oil and mining in Sub-Saharan Africa covering such topics is remarkably sparse; this paper aims at explaining its worth in resource led development debates.

Keywords: resource curse, oil led development, Corporate Social Responsibility, Niger.

<u>Temporal-spectral trajectory based change detection and classification for bamboo-</u> <u>dominated forests in Southern Brazil</u>

Clara J. Greig¹, Colin Robertson² and Andre E. B. Lacerda³

Geography and Environmental Studies, Wilfrid Laurier University, <u>grei4780@mylaurier.ca</u>
Geography and Environmental Studies, Wilfrid Laurier University, <u>crobertson@wlu.ca</u>
Biological Sciences, Universidade Alto Vale do Rio do Peixe, andre.biscaia@embrapa.br

With access to collections of continuous satellite imagery over a 40-year period, temporalspectral signatures now serve as an effective method to monitor and identify changes occurring over a landscape. In this paper, Landsat-time series are used to examine the temporal-spectral signature of bamboo-dominated forest succession occurring within the mixed Ombrophilous Forest, a pine dominated sub-tropical biome belonging to the critically devastated and threatened Atlantic Forest in the south of Brazil. This region has been reduced to <1% primary forest and 20-25% secondary forest of its original landcover. Alteration of canopy structure through anthropogenic disturbance has increased understorey light climate, enabling native invasive bamboos to flourish and encroach on existing forest communities, resulting in loss of biodiversity. In this research, we aimed to identify the temporal-spectral signature of bamboo-dominated forest, in order to characterize stages of forest succession and determine regions of bamboo-dominance. A theoretical temporal-spectral development model was developed based on field observation and previous research. This theoretical model was then compared to a time-series of vegetation indices obtained from 32 years of Landsat data. Root -mean square error between each pixel in the study area and the theorized spectral-temporal model were computed and summarized. Preliminary results indicate that spectral-temporal signatures have the ability to effectively classify different phases of bamboo-dominated forest succession.

Keywords: Landsat time-series; Change detection; Bamboo; Disturbance; Brazil

The effect of Double-crested cormorant (*Phalacrocorax auritus*) associated tree mortality on invasive European fire ants (*Myrmica rubra*) at Tommy Thompson Park, Toronto, Ontario

Aditi Gupta^a, and Gail S. Fraser^{a,b} ^aFaculty of Environmental Studies, York University, Toronto, ON ^bcorresponding author, <u>gsfraser@york.ca</u>

The pestiferous and invasive European fire ant (*Myrmica. Rubra*) appears to be widespread in southern Ontario. Our study examined how the habitat transformation from a nesting native waterbird species, Double-crested cormorants (*Phalacrocorax auritus*) impacted the distribution and abundance of *M. rubra* at Tommy Thompson Park, in Toronto (TTP), Ontario. We characterized habitat changes due to cormorant nesting and examined *M. rubra* abundance and nest density at twelve stations at TTP in August 2009 and 2014. Between 2009 and 2014 habitat transformations caused by nesting cormorants reduced *M. rubra* habitat, locality, abundance and nest density. Cormorant transformation of habitat nesting naturally controlled an invasive species that has yet to be managed in North America.

Key words: M.rubra, Double-crested cormorants, abundance, nest density

<u>Exploring shifting foodscapes during transition into permanent supportive housing in</u> <u>Kingston, Ontario</u>

Author: Madison Hainstock, School of Kinesiology and Health Studies, Queen's University

People who experience extended and multiple periods of homelessness, whose daily routines are highly structured around securing basic necessities, develop a remarkable level of resilience procuring food. When performed with consistency and regularity, such geographies of survival can be given meaning and value, in which food becomes deeply embedded in complex physical and socio-cultural processes that impact a persons' sense of wellbeing. Since 2008, a 'Housing First' (HF) model has become the intervention of choice for transitioning Canada's chronic and episodic homeless population into permanent housing. However, exiting homelessness for many participants has been complicated by a loss of daily routines and activities, challenges redeveloping independent living skills, discrimination, a lack of community integration, loneliness, isolation, and prolonged social stigma. This presentation will look to provide a critical review of the current literature, to set the stage for future empirical research with people who have experienced chronic homelessness and are now enrolled in permanent housing programing in Kingston, Ontario. By exploring shifting food journeys of people transitioning in permanent housing, we hope to gain a better understanding of how daily activities of food procurement impact a person's sense of wellbeing and shape transition experiences. It is anticipated that although people are defined as "housed," the proposed study will reveal how issues connected to food procurement and social isolation, may remain unresolved within permanent housing interventions.

Key words: permanent supportive housing, wellbeing, foodscapes, transition.

Borderless Waters: An Evaluation of Indigenous Perspectives in the Mackenzie River Basin Transboundary Agreements

By: Teall Hall Affiliation: Carleton University Across the world, countries have been experiencing problems related to water, which are now being associated with poor government leadership. One of the greatest challenges with waterrelated issues is dealing with transboundary water, with the different interests of actors, who are divided by political borders. This includes Indigenous peoples, whose perspectives on water have largely been excluded, despite widespread recognition that water management should include all affected parties. The Mackenzie River Basin is classified as an inter-provincial transboundary watershed in Canada. The largest north-flowing river in North America, and home to a large Indigenous population (50% of the NWT), investigating how Indigenous perspectives contribute to transboundary water management is important for ensuring that water management is shared across the basin. With the application of discourse analysis as a methodological tool, this study traces the incorporation of Indigenous perspectives in the Mackenzie River Basin Transboundary Agreements (and supplementary documents), and negotiations between Alberta and the NWT. Special attention is paid to the perspectives on nature from both Indigenous and scientific knowledge. The primary goal of this study is to look at if and how the agreements utilized Indigenous perspectives on water.

Places of Erasure : Assimilation impact on indigenous "sense of place" Shirley Hall

Wilfrid Laurier University

The Truth and Reconciliation Commission of Canada report and subsequent Calls to Action, as led by Dr. Murray Sinclair, can be seen as a catalyst for the recent burgeoning interest in research by and with Aboriginal peoples and communities across Canada. Assimilation into residential schools has left immense scars on the remnants of Indigenous people, being stripped of their ability to practice and perpetuate their own cultural traditions. As Indigenous "sense of place" has been bequeathed through oral tradition and passed along from generation to generation, this disruption can be seen as having immense impact. In order to unearth the gaps in indigenous traditional knowledge about "sense of place", it is imperative to study these representations emerging from these narratives, as they hold answers as to how traditional knowledge about "sense of place" comes to be known and is transmitted across generations. Using a combination of participantgenerated oral and visual data, map representations of the impact of assimilation on indigenous "sense of place". This research will heighten awareness for nonindigenous and indigenous alike, about the richness and spirituality that indigenous oral and visual traditions bring to understanding experience(s) of place, while simultaneously contributing towards reconciliation between these fractured communities and Canadians.

Keywords: sense of place, indigenous, mapping

Title: Urban Size and Academic Focus: Exploring Trends in Canadian Urban Geography, Planning and Policy Literature

Author: Maxwell Hartt

School of Planning, University of Waterloo 200 University Ave W, Waterloo, ON, N2L 3G1 647-331-1533 mhartt@uwaterloo.ca

Abstract:

Between 1996 and 2001 almost half of the urban areas in Canada lost population. This uneven pattern of growth prompted an examination of the English-language urban geography, planning and policy-related academic literature in 2001, which determined that Canadian urban research fixated on large, growing metropolitan areas. Revisiting this literature a decade later with a thorough review of 1518 articles in eight Canadian academic journals, large urban areas have continued to dominate the academic discourse. Although articles dedicated to smaller and middle size urban areas are still relatively underrepresented in the literature, research focusing on more than one size of urban area has grown tremendously. This reflects an emerging interest in regional connectivity and a rise in the perception of urban areas as systems, rather than individual entities. Further analysis reveals distinct changes in the economic sector concentration of the Canadian urban literature as there were significantly fewer articles focused on resource extraction, manufacturing and tourism.

Keywords: urban change, academia, shrinking cities

Lucky Realizations of the Snow-AO Relationship in CMIP5 Models

Tyler Herrington, Dr. Chris Fletcher Department of Geography and Environmental Management University of Waterloo, Waterloo, ON

Presenting Author: Tyler Herrington (therring@uwaterloo.ca)

Previous studies have demonstrated a statistically significant relationship between the observed October snow cover in Siberia, and the phase and strength of the Arctic Oscillation (AO). This relationship has only been able to be recreated under isolated circumstances in climate models, however. Here we explore the relationship between October snow cover in Eurasia, and atmospheric circulation over the North Atlantic, focusing on data from three Coupled Model Inter-Comparison Project (CMIP5) models. We only consider models that display 40-year time-periods with a correlation between the Dec-Jan-Feb Z500 Polar Cap and Oct Eurasian snow cover (hereafter AO-snow correlation) of \geq 0.35, in order to analyze scenarios with similar correlations to the observational record. Sea level pressure, geopotential height, and upward wave activity flux (v*T*) are considered over 40-year time periods where the AO-snow correlation is \geq 0.35 (hereafter "lucky time periods").

A feature of the observed AO-snow relationship is that in years with relatively high Oct snow cover over Eurasia, a negative AO mode generally develops over the North Atlantic over the following winter. We find that despite showing a similar AO-snow correlation to the observations over select "lucky" time periods, none of the three models explored appear to exhibit similar patterns of development of sea level pressure, geopotential height, or v*T* to that of the observed, suggesting that snow cover may not be the main control on the development of the AO.

Keywords: Northern Annular Mode, Arctic Oscillation, Climate Variability, Atmospheric Teleconnections

Mapping Pevensey Bay: The Historical, Environmental and Cartographic Evidence Christopher Macdonald Hewitt, Ph.D. Department of Geography Social Science Centre University

of Western Ontario 1151 Richmond Street London Canada N6A 5C2

Abstract:

Despite their obvious importance as historical sources, few historical studies rely appreciably upon maps or other forms of cartographic representations. Such omission is particularly obvious in the case of medieval warfare. As part of an effort to effectively demonstrate the value of cartography to historical analysis, this study examines land uses in eleventh century Pevensey Bay, England, the landing site of the Norman Army prior to its engagement in the Battle of Hastings, fought in 1066. Specifically, information regarding land uses of the late eighteenth century, in combination with data from earlier maps and environmental studies, are analyzed to provide a detailed representation of the target area. Such information casts considerable new light on the landing conditions of the Norman Army at the time, as well as some insight as regards to the resources available to the invaders on arrival. The study concludes with a discussion of the applicability of the methods employed for other historical events and periods. Keywords:

Pevensey Bay, Historical Maps, William I, Environmental Studies

Applications of RADARSAT-2 polarimetric data for assessing degraded white mangrove forests

Duncan J. E. Hill¹, John M. Kovacs¹ and Francisco Flores-de-Santiago²

¹Department of Geography, Nipissing University, North Bay, ON, Canada

²Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, Coyoacán D.F., México

Keywords: remote sensing, synthetic aperture radar, mangrove

Previous research exploring the use of active Synthetic Aperture Radar (SAR) remotely sensed imagery in mangrove studies has focused mainly on backscatter from different polarization bands. With the latest generation of SAR sensors now offering fully-polarimetric modes, new polarimetric analysis techniques are available. In this study, we evaluate the application of these techniques for assessing a degraded white mangrove *(Laguncularia racemosa)* forest on the Mexican Pacific using C-band RADARSAT-2 Fine Quad imagery. Several Fine Quad images were obtained over the Agua Brava Lagoon study area where biophysical measurements were recorded in 2014 and 2015. Polarization parameters extracted from the imagery were compared to the field data across forest stands of varying condition (healthy, poor condition, dead). Specific polarization parameters extracted and multiple polarimetric response plots and multiple polarimetric decompositions. Each parameter was also evaluated for the different incidence angles images were acquired at to determine if there is an ideal imaging angle for mangrove applications.

Using Photovoice to Understand Climate Change Adaptation in Rural Ontario

Hissa, K. (Department of Geography and Environmental Studies, Wilfrid Laurier University) Abstract

The examination of community adaptation and resilience approaches to address the threats of climate change in rural Ontario is becoming increasingly important in emergency management and preparedness. Community engagement becomes critical in this regard, as local experiences partly

influence perceptions of climate change risks within municipalities. Photovoice is a communitybased participatory research methodology that empowers participants to document their perceptions and understandings of a particular issue through the use of visual images. This technique was undertaken to understand the impacts of the F3 tornado that hit the community of Goderich, Ontario in 2011 and capture their member's perceptions on disaster recovery and climate-related threats. For this project, I worked with 10 community photographers to refine themes (n=7) related to the impacts of the extreme event on critical infrastructure as well as community strengths and challenges associated with climate change resilience. My findings indicate that the F3 2011 tornado brought vast hardship to the residents of Goderich of which they still experience five years later and that differing opinions during the recovery process encouraged controversy – hindering some of the social cohesion during rebuild. Despite the community's fast recovery, certain infrastructure such as banking and businesses remains to be vulnerable to future disaster. Most importantly, optimistic acceptance and positive outlook regarding their perception of community strength and resilience despite losses was an overwhelming theme for the participants in this project.

Keywords: Climate Change; Adaptation; Rural Ontario; Photovoice

Lake Ice/Water Segmentation of Dual Polarization RADARSAT-2 SAR Imagery with the Iterative Region Growing using Semantics Algorithm

Marie Hoekstra, Claude Duguay (Department of Geography and Environmental Management, University of Waterloo), David Clausi (Department of Systems Design Engineering, University of Waterloo)

Changes to the state of ice cover on lakes throughout northern landscapes has been established as a strong indicator of climate change and variability. In addition, monitoring the extent and timing of ice cover is required to allow for more reliable weather forecasting across lake-rich northern latitudes.

Currently the Canadian Ice Service (CIS) monitors over 130 lakes using RADARSAT-2 SAR (synthetic aperture radar) and optical imagery. These images are visually interpreted, with lake ice cover reported weekly as a fraction in tenths. An automated method of classification would allow for more detailed records of lake ice extent to be delivered operationally.

The Vision and Image Processing Research Group at University of Waterloo has developed the Iterative Region Growing using Semantics (IRGS) algorithm, allowing for automated segmentation of SAR scenes, and has been tested in the classification of sea ice with up to 96% accuracy. This algorithm separates homogeneous regions in an image using a hierarchical watershed approach, then merges like regions into classes. These classes are manually labeled by the user, however automated labeling capability for lake ice is currently in development.

In this study, we have employed IRGS to segment ice and water in dual-polarization RADARSAT-2 scenes of Great Slave Lake. An accuracy assessment has been performed on the results, comparing outcomes with user generated reference data and the CIS fraction reported at the time of image acquisition. The results demonstrate the potential of this algorithm to quickly and accurately provide detailed lake ice cover information in the future.

Keywords:

cryosphere, RADARSAT-2, segmentation, lake ice

Local multicriteria analysis and agent-based models for simulating urban land use patterns

Hossein Hosseini¹, Jacek Malczewski²

¹Presenter, Department of Geography, University of Western Ontario, London, ON N6A 5C2, Canada ²Supervisor, Department of Geography, University of Western Ontario, London, ON N6A 5C2, Canada

Abstract: The conventional models for simulating land use patterns are insufficient in addressing complex dynamics of urban systems. A new urban models, inspired by research on cellular automata and multi-agent systems, has been proposed to address the drawbacks of conventional modeling. Any urban dynamics, including urban development, is the result of action and interaction of different types of agents that exist over the landscape. In urban models, an agent represents an individual or interest group. To simulate urban development, one should first simulate the decision behavior of different types of agents. Each type of agent has different preferences and priorities, and makes its location decision according to these preferences. Agents evaluate the suitability of each parcel of undeveloped land using a number of criteria and choose the best land(s) for development. However, the landscape is not uniform and agents' preferences with respect to the evaluation criteria vary from one location to another. The contribution of this research is to model the urban development by considering the heterogeneity that exists in agents' preferences. The local multicriteria analysis approach is used for modelling the decision behavior of different types of agents.

Keywords: urban land use; cellular automata; multi-agent systems; local multicriteria models.

Title: Dissolved organic carbon dynamics in a constructed fen in the Athabasca Oil Sands Region, Alberta

S.E. Irvine, M. Strack, J.S. Price

Department of Geography and Environmental Management, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, N2L 3G1

s2irvine@uwaterloo.ca

In the Western Boreal Plain fens comprise 50% of the landscape, however much of this area is disturbed through bitumen extraction in the Athabasca Oil Sands. Since there is a legal requirement to return equivalent land capability, the Nikanotee Fen was constructed with two metres of peat colonized by moss, planted sedge species, and spontaneously occurring vegetation. As the system develops dissolved organic carbon (DOC) is likely to be sourced from both peat and vegetation. This source of DOC may have implications for its carbon balance and downstream water quality. Yet, there is limited information on DOC dynamics in constructed peatlands, with none focusing on site-specific vegetation controls or DOC transport. We report on changes in DOC concentrations through the peat profile, inputs through groundwater and losses from discharge between June and August 2015. Preliminary results indicate that DOC concentrations increase through the peat profile over time within the Nikanotee Fen. Concentrations remain consistent temporally and spatially within mineral substrates which supply the fen with water. The amount of DOC within the system increased through the summer of 2015 due to greater net production within the fen, and limited

outflow from this system. Low discharge through this period is attributed to the small amount of precipitation received compared to the climate normal for these months. Overall, the DOC budget of this constructed fen is primarily controlled by within-site production. This is likely a function of minimal precipitation received within this system, however this balance may change with varying precipitation inputs.

Keywords: peatland, reclamation, carbon

Planning for controversial land uses: the case of medical marijuana dispensaries (MMDs) in Toronto

David Johnson – University of Waterloo (Master's Student) Dr. Jennifer Dean – University of Waterloo (Principle Investigator)

Medical marijuana dispensaries (MMDs) have been opening in cities across Canada in response to changing legislation that supports the use of marijuana to treat certain health conditions. There currently is an absence of standard procedures for siting dispensaries that sell this controlled substance. Further confusing the issue is that the federal government has promoted the future decriminalization and legalization of marijuana for recreational use. With rapidly changing federal laws and provincial guidelines for medical and recreational marijuana use, there is a need to assess the impacts of MMDs at the municipal level both in terms of planning policies and practices that provide guidance for the siting of MMDs, and for balancing diverging expectations and reactions from multiple publics. This presentation discusses preliminary findings of a case study of medical marijuana dispensaries in Toronto, Ontario. This study collected qualitative data about the existence and siting of this controversial land use from key informants working in Toronto as well as conducted a media analysis of recent MMD articles from two local and one national newspaper. Preliminary findings highlight the multiple and competing perspectives of citizens, advocates and policy-makers with respect to MMDs and the public good. Future research directions and policy implications will be discussed.

Planning | Public Health | Public Goods | Controversial Land Uses | Medical Marijuana

Models of direct editing of government spatial data: Challenges and constraints to the acceptance of contributed data

Peter A. Johnson

Assistant Professor, Department of Geography and Environmental Management, University of Waterloo, Waterloo, Ontario, <u>peter.johnson@uwaterloo.ca</u>

Abstract

The current popularity of government open data platforms as a way to share geospatial data has created an opportunity for government to receive direct feedback and edits on this very same data. This presentation proposes four models that can define how government accepts direct edits and feedback on geospatial data. The four models are; a 'status quo' of open data provision, data curation, data mirroring, and crowdsourcing. These models are placed on a continuum of

government control ranging from high levels of control over data creation to a low level of control. Each model is discussed, with relevant challenges highlighted. These four models present an initial suite of options for governments looking to accept direct edits from data end users, and can be framed as a partial realization of many of the principles of open government. Despite the varied potential of these approaches, they generate a shift in control away from government, creating several areas of risk for government. Of these models, near-term interest may focus on data curation and data mirroring as evolutionary, rather than revolutionary steps that expand on the simple provision of open data.

Keywords: open data, open government, crowdsourcing, geospatial data

Smallholder Agricultural Mechanization in the Northern Savanna of Ghana: Implications on Land use and Production Patterns

Moses M. Kansanga^{1*} and Peter Andersen²

- 1- Environmental Hazards and Health Lab, Department of Geography, Western University, London Canada
- 2- Department of Geography, University of Bergen, Norway

Abstract

Smallholder agriculture in the northern savannah of Ghana is largely rain-fed, with limited facilities for irrigation. Fluctuations in the timing and distribution of rainfall coupled with the limited information to monitor erratic climatic patterns have created uncertainty regarding suitable planting periods. Given the difficulty with the use of basic hand-held farm inputs to prepare farmlands expeditiously in anticipation of rain, farmers have responded to these challenges by resorting to using tractors in land preparation. However, despite the increased use of tractors by smallholder farmers, its implication on agricultural land use and cropping patterns has received little research attention. Using a mixed method approach, this study examined the nature of tractorbased mechanization and its impact on farm sizes, crop patterns and agricultural land access among smallholder farmers from 2005 to 2015 in Navrongo in the Upper East Region of Ghana. Our findings indicate that, the use of tractors has resulted in a sharp increase in farm sizes from the base year in 2005 when tractor use was minimal. The expansion in farm sizes is accompanied by a changing cropping pattern away from the production of native staples to market-oriented crops. Furthermore, the study reveals growing intra-family land use tensions over fertile lands leading to 'intra-family land grabbing'. Farmers have responded by adopting protective measures including continuous cultivation and lending uncultivated land to farmers outside the family lineage. Based on these findings, we recommend mechanization policies should target the provision of relatively smaller horsepower tractors within the affordability range of smallholders.

Key words: Mechanization, Smallholder Farmers, Land Use, Cropping Pattern

The diffusion of renewable electricity technologies in Canadian remote aboriginal communities using the technological innovation systems approach

K. Karanasios and P. Parker

Department of Geography and Environmental Management, University of Waterloo

Abstract

The aim of the paper is to apply the Technological Innovation Systems (TIS) approach to analyze the diffusion of renewable electricity technologies (RETs) in remote Canadian communities, which are in need of reliable and clean electricity to address social, environmental and economic development issues. The study examines the slow diffusion of RETs during the 1974-2016 period and (a) identifies the past and current functional pattern and performance and the systemic problems that shape the diffusion process, and (b) generates insights about the main factors that have the potential to sustain the development of the TIS, taking into consideration current trends, current projects in grid connected communities, and the plans for northern resource developments. Although there is evidence that the accumulation of TIS functions determines the rate of diffusion of the renewable technologies, addressing a number of systemic problems through policy could lead to accelerated diffusion of RETs to the benefit of the communities and other stakeholders.

Keywords: technological innovation systems; energy systems; renewable power; remote aboriginal communities

Discerning Effects of Multiple Stressors on Lakes of the Athabasca Delta using Paleolimnology <u>Mitchell L. Kay</u>^a, Erin MacDonald^a, Kristen Wesenberg^a, Kathleen Brown^a,

[Insert Student Names here] ^b, Jasmina Vucic ^a, Laura Neary ^a, Johan A. Wiklund ^a, Roland I. Hall ^a, Brent B. Wolfe ^b

a Department of Biology, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1

b Department of Geography and Environmental Studies, Wilfrid Laurier University, Waterloo, Ontario, Canada N2L 3C5

The Peace-Athabasca Delta is a large boreal freshwater delta that primarily relies on river floodwater to maintain the ecological health of numerous lakes. In recent decades, there has been concern over the potential effects of multiple stressors, including energy development projects and climate change, on lake water quantity and quality in the delta. Paleolimnological approaches are being used to assess the roles of these stressors from long-term records of hydrology and metal deposition. During the past several years, sediment cores have been obtained from multiple floodprone lakes along the Athabasca River in the Athabasca Delta, and sectioned into 1 cm intervals. Sub-samples from each interval will be analyzed for radiometric, physical (including loss-onignition), and geochemical parameters and biota to reconstruct past hydrological conditions and metal deposition for the past century or more. Preliminary results from loss-on-ignition from seven lake sediment cores show that recent geomorphic changes in flow of the Athabasca River have had a profound influence on lake hydrology in the Athabasca Delta. Notably, this has caused Athabasca River flow to be diverted away from the northeastern sector of the Athabasca Delta, which is the traditional territory of the Athabasca Chipewyan First Nation. Ongoing analyses will refine the paleohydrological reconstructions and data obtained from pre-1920 lake sediment samples will be used to establish a baseline to evaluate post-1967 sediment samples for evidence of pollution.

Title: Treeline Expansion Along the Canol Heritage Trail, NWT, Canada - >70 years Post-Disturbance

Authors: Geoffrey G.L. Kershaw¹, Steven D. Mamet^{2,3}, and G. Peter Kershaw

Affiliations: ¹Geography and Environmental Studies Department, Wilfrid Laurier, Waterloo, ON, N2L 3C5; ²Biology Department, University of Saskatchewan, Saskatoon, SK, S7N 5E2; ³Department of Soil Science, University of Saskatchewan, Saskatoon, SK S7H 5A8; ⁴Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, AB, T6G 2E3

Abstract: In many areas throughout the northern hemisphere, treeline has advanced latitudinally and altitudinally. At the same time, shrubs have expanded in tundra ecosystems. The role of anthropogenic disturbance in facilitating or retarding these ecosystem transitions is poorly understood. Some studies report increased recruitment associated with disturbance, while others report treeline recession. The Canol Heritage Trail (CANOL Project 1942-5) provides access to treeline in the Selwyn and Mackenzie Mountains from Macmillan Pass to the Dechen Lá barrens. Subalpine fir (*Abies lasiocarpa*) dominates lower elevations with sporadic white spruce (*Picea* glauca) and balsam poplar (Populus balsamifera) along the trail. The forest transitions into dwarf birch (Betula glandulosa) dominated areas at higher elevation, where only scattered, stunted tree islands persist. Here we report on the natural recruitment history of tree species in the area, as well as our intended investigation based on the hypothesis that human disturbance has created a dispersal corridor for recent tree recruitment. Past recruitment events of fir, spruce, and poplar are reconstructed from tree-ring analysis and compared to temperature trends from 1800-2000. On disturbed areas, a 2012-2015 census of tree recruitment was done. Stem density and age structure of tree species on disturbed areas will be compared to off disturbance samples to establish if preferential recruitment is occurring. This presentation will conclude with off-disturbance sampling procedures and our intended analysis as this portion of the study has yet to be completed and the authors welcome critical comments and observations on the subject.

Keywords: Treeline, Climate Change, Anthropogenic Disturbance, Mackenzie Mountains

Living and Learning with Locals: A Gender Perspective about Conducting Fieldwork in Unfamiliar Environments Author: F. Noori Khan

One way to understand the complexity of social change is to immerse oneself in it. The purpose of my research was to explore gender dynamics, specifically the status of fisherwomen with regards to environmental change and adaptation in the fishery commons of Chilika lagoon, a lagoon situated on the east coast of India. To conduct fieldwork, I travelled to Chilika and lived with local fisher communities in rural villages I had never visited. I quickly understood that it was essential to acknowledge my own gender identity as a woman in the field. I learned that being a woman

presented particular benefits and challenges while conducting research. This paper will share a gender perspective about conducting ethnographic, qualitative research. I will discuss my participatory approach to this research. More broadly, I will examine the struggles of being a woman and an outsider in the field and the strategies I used to overcome these challenges. My experience of living and learning with local communities in Chilika fostered an opportunity to not only gather research necessary for my project but also to recognize the significance of my personal identity in the field. I offer insight on how researchers adapt to the social setting and environment of their field sites. Furthermore, I discuss how my immersion into this research on social change led to valuable subjective and personal experiences.

Mississauga's urban forest: Assessing local and regional climate vulnerability

<u>Talha Khan</u> – M.Sc. Candidate, Department of Geography, University of Toronto Dr. Tenley Conway – Department of Geography, University of Toronto, Mississauga

Urban forests are stressed by poor soil quality, flood events, droughts, and anthropogenic disturbance. Changes in temperature, precipitation, and extreme weather events as a result of climate change can cause additional physiological stress to urban tree species. Present research focuses on how urban tree species can help alleviate climate change impacts but often fails to mention the susceptibility of species to a changing climate. This study seeks to examine City of Mississauga's urban forest species composition to explore the susceptibility of common native and non-native species to predicted climate change scenarios on a local and regional scale. Physiological growth requirements and climate tolerances (i.e. minimum temperature, drought tolerance, etc.) of abundant tree species were gathered to evaluate stressors under modeled climate conditions in the short-term, the year 2040, and long term, the year 2100. A matrix was created to highlight the susceptibility of species to particular climate conditions and weather events. Preliminary finding and next steps will be presented. Examining species composition and climate vulnerability on a regional scale can provide information on how resilient urban forests may be to future climate change, and how to ameliorate species loss. This research can aid urban forest management plans in species selection and extending the life expectancy of individual trees, thus saving time and money, and retaining ecosystem services.

Keywords: climate change, climate susceptibility, urban forest, species distribution

The Gendered Spaces of Volunteer Tourism

By: Amy Kipp, Drs. Roberta Hawkins and Noella Gray (Department of Geography, University of Guelph)

Abstract: Volunteer tourism, in which individuals participate in voluntary work while vacationing abroad, is an increasingly popular and researched form of travel, considered by some academics to be a sustainable form of development. Within this form of "development-travel" there exists an extremely uneven gender divide with a four to one ratio of female to male participants. Although commonly cited, little research exists on this gender gap and the potential impact it may have on volunteer tourism and by extension the field of international development. This paper explores the gender divide by examining the spaces, activities and interactions that volunteer tourists have

access to on these trips. Additionally, a feminist critique is applied to the concepts of global citizenship and the geography of care in relation to the gendered nature of volunteer tourism.

This study is based on preliminary findings from 40 semi-structured interviews with former male and female volunteer tourists, as well as data collected during participant observation on a twoweek long volunteer trip in Guatemala. Emerging themes in the data include: gendered concerns around safety and responsibility, privilege and power, and the intersectionality of multiple identities. Ultimately, this paper suggests that the gender gap that exists in volunteer tourism has the potential to impact the representation and understanding of the Global South in the Global North in a particularly gendered way and that in order to better understand the spaces of volunteer tourism more critical, feminist research is needed.

Keywords: volunteer-tourism, gender, global citizenship, geographies of care

Is the Athabasca River Being Polluted from Alberta Oil Sands Development?

Klemt, Wynona H. (1) (wklemt@uwaterloo.ca), Roland I. Hall (1), Brent B. Wolfe (2) (1) Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1 (2) Department of Geography and Environmental Studies, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5

Key words: paleolimnology; monitoring; Alberta oil sands; metal pollution

Alberta oil sands mining and processing began operations in 1967, but onset of environmental monitoring of the Athabasca River and adjacent floodplain lakes by the Regional Aquatics Monitoring Program (RAMP) to assess levels of oil sands contamination was initiated 30 years after development. Consequently, no pre-industrial baseline exists upon which current river sediment quality can be compared. This situation is further complicated, because the Athabasca River flows through the naturally bitumen-rich McMurray Formation, where riverbank erosion and groundwater mixing provide natural inputs of contaminants to the Athabasca River. This undermines an ability to determine the relative importance of contaminants supplied by natural versus industrial processes to nearby aquatic environments. My project will focus on characterizing metal concentrations deposited via the Athabasca River in flood-prone lakes located upstream (2-85 km) and downstream (3-20 km) of central oil sands operations before and since the onset of oil sands development. Floodplain lakes provide a unique archive of river contaminant concentrations over time. My research will assess the concentrations of priority metals of concern in the oil sands region (including Be, Cd, Cr, Cu, Pb, Ni, V, and Zn) in a set of lakes flooded by the Athabasca River. Elevated concentrations of these metals were detected in snowpack and river water near oil sands operations (Kelly et al., 2010. PNAS, 107(37), 16178-16183). We will determine a baseline of concentrations for these metals and assess the temporal record for evidence of pollution in recent decades.

Title: The Ka'a'gee Tu Atlas: Community-based monitoring of landscape change in Kakisa, NT

Kaitlin Kok, Masters of Environmental Studies, Wilfrid Laurier University Keywords: Community Based Monitoring, Participatory Action Research, traditional ecological knowledge, decision making The remote community of Kakisa, NT, situated southwest of Yellowknife, has experienced a great deal of change amongst the community's surrounding land. As the community is highly dependent and connected to the land for their well-being, the environmental changes which have been noted by community members have created concern regarding their ability to continue traditional ways of living. The aim of this project is to work collaboratively with the Ka'a'gee Tu First Nation (KTFN) to document and track the ongoing changes to their surrounding land through the use of community based-monitoring methods. Methods such as collecting photographs and conducting semi-structured interviews will be stored within a web-enabled mapping system as a way to visualize the history of Kakisa's Indigenous knowledge and also as a way to monitor future environmental change. This system will also be a useful and important tool to land users as a way to enhance community member's safety on the land, but also to researchers and regional decision-

Addressing complexity using multiscale scenario analysis: An overview and future agenda for Canada's energy scenarios

Jude Herijadi Kurniawan (Presenter), Vanessa Schweizer - University of Waterloo

makers to build capacity for future monitoring studies.

Abstract: Energy futures are clearly an important element in policy- and decision-making activities, however understanding the implications of global energy scenarios at the national level is challenging because assumptions and models developed for global analyses are not necessarily appropriate for the local context. Fortunately, recent developments in the field of forecasting in energy and climate change research open new possibilities for conceptualizing alternative futures that are complex, meaning that they include details relevant for different sectors and scales. This development is critical in managing intentional transitions toward an affordable and sustainable path. It has been recognized that a danger of short-term, piecemeal approaches to energy transitions is that they may cause path-dependencies that jeopardize long-term success. A federation like Canada needs to especially wary of this, as jurisdictional powers are divided amongst the national government, provinces, and municipalities. The research objective is to pilot an approach to co-create low-carbon energy futures using a participatory method for scenario planning based on a multiscale scenario framework (i.e. Shared Socioeconomic Pathways). This research employs a systematic yet flexible scenario methodology called the cross-impact balances (CIB) and its variant, called the linked-CIB for multiscale scenario analysis. This research project offers a systematic exploration of uncertainties over a broader spectrum (social/technical, global/local).

Gated communities, equity, and spatial fragmentation in Greater Accra, Ghana Emmanuel Kyeremeh; Hanson Nyantakyi-Frimpong; Godwin Arku

Abstract

The past 15 years have witnessed a phenomenal growth in the number of gated communities in Ghana. Currently, the country has close to two-hundred registered gated communities, of which approximately 80% are in Accra, the national capital. Drawing empirical evidence from selected geographically distinct neighbourhoods, this paper investigates the form, functions, as well as residents' assessment of living in gated communities. It further assesses the main factors that draw people to live in gated residential neighbourhoods. The study was carried out in early 2016 through a random survey of gated community residents in the Accra-Tema city region. While the existing

scholarship attributes the growth in gated communities to urban crime levels, we find that it is rather prestige that draws people to live in such neighbourhoods. Further, our empirical findings show that these gated settlements raise serious concerns with respect to spatial fragmentation and social exclusion of the poorest segment of the urban population. We conclude by highlighting what these findings mean for development planning and social justice in urban spaces.

Keywords: Neighbourhood enclosure; Gated communities; equity; spatial fragmentation; Ghana

Land Ownership and HIV Testing among Married Women in Nigeria

Emmanuel K. Kyeremeh^{1*}, Yujiro Sano², Roger Antabe³ and Joseph A. Braimah³

- 1- Department of Geography, Western University, London Canada
- 2- Department of Sociology, Western University, London Canada
- 3- Environmental Hazards and Health Lab, Department of Geography, Western University, London Canada

Abstract

Although it has been reported that married women are disproportionally vulnerable compared to high risk groups in Nigeria such as commercial sex workers, injecting drug users, and men having sex with men, only one quarter of married women have tested for HIV serostatus. Although factors associated with the uptake of HIV testing have been well-documented, its association to women's land ownership has been largely missing in sub-Saharan Africa including Nigeria. Drawing data from the 2013 Nigeria Demographic and Health Survey and applying the logistic regression technique, we examined the impact of married women's land ownership on testing for HIV, while controlling for demographic, behavioural, and socioeconomic factors. We found that land ownership among married women is positively correlated with HIV testing. Furthermore, women with adequate knowledge of HIV transmission and knowing someone who died from HIV were associated with HIV testing. We also found that richer and more educated married women were more likely to have tested for HIV compared with their poorer and less educated counterparts. Based on these findings, we suggest more governmental interventions in eradicating social and customary barriers that inhibits women's ownership of resources such as land. **Key Words:** HIV/AIDS; Nigeria; Land ownership; Sero-status; Demographic and Health Survey

<u>"I want to develop myself, and my village": A Community Approach to Education in the Luang</u> <u>Prabang Region, Laos</u>

Langill, Jennifer C. MA Student in Human Geography, University of Toronto Research conducted as BAH Student in Global Development Studies, Queen's University

Email: jennifer.langill@mail.utoronto.ca Phone: 647-636-7871

Abstract

This study seeks to understand the lives of rural students who moved to Luang Prabang to pursue their education. It attempts to fill one of the many gaps in the literature about the Lao P.D.R. and in particular qualitative understanding of education. Twelve participants from rural areas who were studying in the town were interviewed about their experiences and perspectives about education

and living in an urban area. This presentation offers the results of this research, based upon direct translations of participant quotations. The primary finding was a strong connection between community and education. This was observed through three phases of education: The community effort to pursue education, a communal atmosphere during studies in the town, and desires to benefit the community with one's formal education. The results also indicated an assumption of the inherent value of education, sacrifices for education, and a low quality of education. The findings illustrate the commitment of the participants and their community to their formal education. This presentation considers these results in the broader education and education beyond schooling. It concludes that the education system and experiences of students moving to urban areas for education in Laos is very unique, particularly the interpreted community approach to education. The presentation closes by offering suggestions for further research on education and the Lao P.D.R.

Keywords

Lao PDR – Education for Development – Community Obligation – Student Living

Acknowledgements

This research was supervised by Dr. Villia M. Jefremovas.

20 Years Later -Evolution or (De)Evolution of Ontario Great Lakes Shoreline Management Plans, 1995-2015: A Case Study of Elgin County.

Patrick Lawrence, Department of Geography and Planning, University of Toledo, OH <u>patrick.lawrence@utoledo.edu</u> (& UW Geography Alumnus, BES 1989, PhD 1996)

In 1995 the first policies and programs leading to the development of Ontario-Great Lakes Shoreline Management Plans (SMPs) were implemented by the Province of Ontario via delivery by the Ministry of Natural Resources (MNR). In the subsequent years numerous plans were completed by Conservation Authorities (CAs) or MNR District Offices covering large sections of the Great Lakes shoreline within the Province and various technical and policy support guidelines and requirements were development and utilized. From 1989-1993 various CAs completed SMPs that covered the Lake Erie shoreline within Elgin County. Within those plans over two decades old, and with recent changes to the Elgin County (EC) Official Plan in 2012, a SMP specific to Elgin County was undertaken and completed in 2015. This paper reviews the major management and planning concepts and components in the 2015 EC SMP in reference to the role and impact of broader ecosystem planning, integrated coastal management, and conservation principles that have emerged over the last 20 years and influenced coastal management and planning worldwide. The intent is to ask whether the 2015 plan truly reflects those ideals and whether the past two decades have truly seen improvements and advancements in the thinking and application of planning innovations or whether little if any such progress has been made. Environmental management, planning, Great Lakes, water resources

Title: Assessing the impacts and perceptions of smart grid interventions on suburban residential energy culture

Submission type: Oral paper presentation

Authors: Lazowski, B., Parker, P. (Department of Geography and Environmental Management, University of Waterloo) and Rowlands, I. H. (School of Environment, Resources and Sustainability, University of Waterloo)

Keywords: Demand side management (DSM); Intervention; Smart grid; Energy cultures

Abstract:

Smart grid engagement tools (e.g., web portal, reminders) are important to reduce residential electricity consumption, but which are the most effective to achieve residential conservation culture? Insights for smart grid policy and program development are identified from a qualitative analysis of a residential smart grid project in a suburb of Toronto, Canada. Several project interventions were implemented over three years. Insights gathered from this case study were applied to Stephenson et al.'s (2010) Energy Cultures framework, to identify factors influencing a residential 'smart' energy culture. Structured qualitative interviews evaluated the interventions' impacts on participants' cognitive norms (attitudes, awareness, motivations and barriers towards conservation), material culture (technical changes) and energy practices (conservation actions). Interventions participants perceived as 'effective' for shifting energy culture are the focus of this study, including: the web portal, reminder emails, webinars, incentivized control program and weekly electricity reports. Increases in self-reported awareness and action levels were accounted for, with the web portal and weekly newsletter causing these changes. Future smart grid policy and programs could benefit from private and comparative feedback through web portal and newsletter feedback tools. With lifestyle and convenience highlighted as significant conservation barriers, user-friendly engagement through mobile applications accessible on multiple devices were identified as key directions for future projects.

Abstract:

Title: Re-examination of the Semple and Phipps model of the dispersion of corporate headquarters

Presenters: Martin R Lefebvre and Grant L Morin

The dispersion of corporate headquarters is a rarely discussed topic within economic geography. This paper returns to this area with a re-examination of the highly cited Semple and Phipps model of the dispersion of corporate headquarters. Access to additional data from Moody's business annual of 1920 and 1930, as well as Compustat publicly traded firm data for the period 1950 to 2015. A spherical application of Ripley's K as described by Robeson, Li, and Huang (2015) multi range-band insight into the clustering and diffusion of headquarters. Further examination of the new data provides insight more aligned to that of the Taaffe, Morell, and Gould model of

transportation development. Affiliation: University of Western Ontario Key Words: Corporate headquarters, Cluster Analysis, Spatial Analysis, United States

Statistical Downscaling Future Soil Temperature at a Northern Airport in Quebec

Andrew C.W. Leung¹, Tanzina Mohsin¹, William A. Gough¹ ¹ Climate Laboratory, Department of Physical & Environmental Sciences, University of Toronto Scarborough

With Arctic region being one of the areas experiencing fastest warming in the world, we seek to determine the long term trends and future projections of soil temperature in northern Canada. Using 28 years of soil temperature from 5cm to 150cm depth at Kuujjuaq, Quebec, we identified a significant warming rate of approximately 0.9°C per decade at 5cm soil depth from 1967 to 1995. We then used statistical downscaling software (SDSM) to assess if it can be applied to project future soil temperature, a first for this software to be used on subterrain processes. We found that the software was able to reasonably project mean and, to a slightly lesser extent, minimum soil temperature but not as accurately for maximum soil temperature. This may stem from the software being designed and calibrated for weather conditions above surface. The variation of temperature reduces below surface due to soil and snow. The future soil temperature was projected up to 2100. We evaluate the impacts of soil temperature change on airport operations such as the vulnerability of terminals built on top of the permafrost and capability to handle heavy aircraft due to reduced structural strength of ice underneath.

Keywords: climate change impacts, aviation, modelling, downscaling

Title: The importance of user's perceptions of recreational and drinking water in promoting sustainable water resources management: A case study of two rural water townships in eastern China

Li, Sabrina and Elliott, Susan J. (Department of Geography and Environmental Management, University of Waterloo)

Despite notable economic benefits, rapid tourism expansion in developing countries can have adverse environmental impacts, such as the deterioration of water resources and water quality. This calls for the increasing need of sustainable practices in water management to mitigate the depletion of water resources. Public perception of water consumption, water quality, and the impacts of tourism on water quality are important factors to consider when evaluating water sustainability. In this study, a total of 274 participants (residents, tourists, and local business vendors) from two water townships, Hongcun and Zhouzhuang, were surveyed. Results show that a significant number of participants from both townships agree that water consumption has increased while water quality has declined in recent years. However, the impacts of tourism on water quality are not clear among the residents in Hongcun. Despite the lack of a sewer system, some of Hongcun's residents still retrieve drinking water from the village canals, which is susceptible to contamination from paint, detergent, and cooking oil. On the other hand, Zhouzhuang's increasing development in tourism infrastructure has outpaced the expansion of its sewer network, which may lead to subsequent problems in both recreational and drinking water quality. Due to varying geographies, economies, and social environments, Hongcun and Zhouzhuang

have inherently different water management practices. Tourists, residents, and businesses should be made aware of the impacts of tourism on local water quality, and their role in protecting water quality to preserve the cultural authenticity of these townships.

Keywords: recreational water, rural tourism, sustainability, China

Let the Lessons Flow: Transforming Hardships in the Field into a New Researcher Skillset Author: Danielle Lindamood

When scientists try to understand social and environmental change in a country foreign to them, they encounter surprises and challenges. I went to India for my fieldwork to better understand how we can achieve goals like universal access to clean water and sanitation. With my home base in Bangalore, Karnataka, India, I conducted semi-structured interviews and focus groups with a range of people in communities, the NGO sector, government, and academia. During my work with these diverse groups, I came across a variety of political, cultural, economic, and social landscapes. My fieldwork yielded important insights into the effectiveness of water governance and its mechanisms in India. However, during the different stages of this work, numerous unexpected developments emerged and threatened to derail my research and personal wellbeing. Through overcoming these unexpected challenges (e.g., adapting to changes in research design, navigating gender relations in a new cultural context), I learned the importance of my network, my worldview, and the value of engaging in qualitative research. Most of all, I learned the field is a great teacher for those equipped with the right skills to survive.

Should Driverless Cars Still Need Road Maps?

Lingfei Ma, MSc Student, l53ma@uwaterloo.ca Jonathan Li*, Professor, junli@uwaterloo.ca Simon H. Zhao, MSc Student, h224zhao@uwaterloo.ca WatMos Group, Department of Geography and Environmental Management Faculty of Environment, University of Waterloo 200 University Avenue West, Waterloo, Ontario N2L 3G1

ABSTRACT

Multiple sensors onboard cars help them navigate lanes and prevent crashing into vehicles in front, but they are still prone to errors. They cannot always deal with complex road patterns, like which lane the car should take to exit a highway. As such, driverless cars still have to rely on road maps, but in 3D with much more details than that of today's navigation maps. Only a combination of such 3D maps and onboard sensors could help driverless cars navigate multi-lane highways and busy junctions more accurately. What kind of technology could map the layout and inclination of roads in 3D rapidly and accurately and collect details like locations of road signs, traffic lights and pedestrian crossings in the complex road environment? This poster presents driverless cars' requirements on 3D high-definition road maps, followed by demonstrating the potential of a vehicle-borne mobile laser scanning (or a mobile LiDAR) system to make such 3D maps. Highdensity (c.a. 6000 points/m²) point clouds were acquired in Xiamen, China by a RIEGL VMX-450 system and used in this study. Our preliminary results demonstrated that the road edges could be automatically extracted and the road surface markings could be accurately classified from the point cloud data. Quantitative evaluations indicated that road boundaries can be extracted with completeness, correctness, quality of 0.95, 0.98, 0.94, and that road markings be classified with completeness, correctness, and F-measure of 0.93, 0.92, and 0.93, respectively. Our study approved that mobile LiDAR is a very powerful tool to map Canada's million kilometres of highways.

Key words: driverless cars, mobile LiDAR, point clouds, 3D road maps.

Susceptibility and Risk Assessment of Earthquake-induced Landslides Using An UAV-based Approach

Rui LIU*¹², Visiting Scholar, Isjlr@163.com Saied Pirasteh², PhD student, s2pirast@uwaterloo.ca Jonathan Li², Professor, junli@uwaterloo.ca ¹State Key Laboratory of Geohazard Prevention and Geoenvironment Protection College of Geophysics, Chengdu University of Technology Chengdu, Sichuan 610059, China ²WatMos Group, Department of Geography and Environmental Management Faculty of Environment, University of Waterloo 200 University Avenue West, Waterloo, Ontario N2L 3G1

ABSTRACT

A MS7.0 earthquake occurred on April 20, 2013 in Lushan County, Sichuan Province of China. This earthquake triggered a large number of landslides. High-spatial-resolution images were acquired by an Unmanned Airborne Vehicle (UAV) to investigate earthquake-induced landslides after the hazard happened. This poster presents three models (logistic regression, support vector machine, random forest) that were used to study the rule of susceptibility distribution of earthquakes-induced landslides. The area under the receiver-operating characteristic (ROC) curve and ratio were used in evaluating the models' accuracy and assessing the susceptibility. Our study revealed that the random forest model has the highest ratio (2.07) as compared to the logistic regression (1.78) and support vector machine (1.90). The results show that the random forest model has the best performance in the susceptibility assessment of earthquake-induced landslides in the Lushan area.

Key words: landslide, random forest, logistic regression, support vector machine, receiveroperating characteristic curve.

Assessment of Cultivated Land Pressure Status in China

Xiaofang Liu¹, ME Student, 2489731998@qq.com Yajie Zhang^{*1,2}, Associate Professor and Visiting Scholar, yj-zhang@whu.edu.cn Jonathan Li², Professor, junli@uwaterloo.ca Lingfei Ma², MSc Student, I53ma@uwaterloo.ca ¹School of Resource and Environmental Sciences, Wuhan University 129 Luoyu Road, Wuhan 430079, China ²WatMos Group, Department of Geography and Environmental Management Faculty of Environment, University of Waterloo 200 University Avenue West, Waterloo, Ontario N2L 3G1

ABSTRACT

Due to large population and unevenly distribution of productive resources, the relationship between population and food varies in different regions in China. It is very useful to conduct a research of cultivated land pressure distribution within the Chinese territory. Most of existing studies about cultivated land pressure focused on the small range and short time span, which cannot meet the requirement for policy-makers to grasp the whole view of cultivated land quality at the national level. The change of cultivated land pressure index can quantitatively reflect the earing capacity of resources and the largest population within the national and provincial administrative regions. In this poster, according to the cultivated land pressure index model presented by Cai (2002), statistical data such as population, food production, and arable land areas from 1978 to 2012 in China were collected. Then, quantitative analysis and qualitative analysis were conducted to calculate cultivated land pressure index from 1978 to 2012 to analyze change trend and revealed influence factors of cultivated land pressure index. Additionally, this poster indicated spatial differentiation characteristics and regularity in terms of resources endowment, agricultural resources, production conditions, social and economic development status by using system clustering analysis method, which can be helpful to policy-makers for land use planning and cultivated land protection in future.

Key words: cultivated land, pressure index, system clustering analysis, land use.

Investigating grassland properties usinghelicopter-acquired high-spatial resolution hyperspectral imagery

Bing Lu, Cameron Proctor, Yuhong He

Department of Geography, University of Toronto Mississauga

3359 Mississauga Road, Mississauga, ON, L5L1C6

Grassland biochemical and biophysical properties (e.g., chlorophyll content, leaf area index(LAI)) are essential parameters for quantifying the physiological status of vegetation. Remote sensing technologyprovides an efficient approach to investigate the spatio-temporal variations of these properties. However, applications of remote sensing imagery for estimating vegetation properties are often limited by its spatial and spectral resolution. For instance, imagery with low spatial resolution(e.g., decameters) is incapable of detecting species-level (e.g., decimeters) grassland properties since grasses are generally small in size and different species are highly mixed. Similarly, imagery with low spectral resolution (i.e., with a few bands) is technically incapable for measuring discrete spectral features occurring in anarrow wavelength range that arecritical for investigating vegetation properties. Yet, acquiring imagery with both high spatial and high spectral resolutionis challenging given the technical complexity and financial costs. This study explored the use of a hyperspectral sensor(Headwall Photonics, Fitchburg, USA)mounted on a helicopter(Fourseasons Aviation, Toronto, Canada) for the acquisition of high-spatial resolution hyperspectral imagery. The helicopter was operated at approximate 200m above groundin a tall grassland in Ontario and obtained imagery with a spatial resolution of about 30cm. The acquired imagery was firstly radiometrically and geometrically corrected, and then its quality was evaluated using ground measured spectral data. After that, the imagery was applied to estimate grassland properties. Results indicate that grassland properties (e.g. LAI, chlorophyll content) can be accurately retrieved from acquired hyperspectral imageryand spatial variations of these properties were also investigated.

Key words: grassland, remote sensing, hyperspectral, high spatial resolution.

Title: Evaluation of Municipal Government Mobile Applications for 311 Service Requests **Authors:** Qing Lu (MSc Candidate, Department of Geography and Environmental Management, University of Waterloo), Peter Johnson (Assistant Professor, Department of Geography and Environmental Management, University of Waterloo)

Abstract: City governments around the world are expanding their ways of connecting to citizens by adopting new information and communication technologies (ICT). 311 is originally a direct call line that allows citizens to report issues and access non-emergency municipal services, and web and mobile applications have been developed to create additional platforms for citizens to contact the government. This paper characterizes the use of multiple 311 channels in the City of Edmonton, Canada, including telephone, email, web form and mobile app. Three years of request data were analyzed by comparing relative share of service request for each channel and by extracting the spatial patterns of the requests. A regression model was also built to explore the relationships between channel use and sociodemographic variables. The analysis results show a shift in channel usage from traditional to Internet-enabled channels, and that specific digital inequalities exist that reinforce this distinction between traditional and Internet-enabled channels. The paper also presents results of interviews with six municipalities that provide multiple 311 channels. Respondents compared different channels and indicated advantages and challenges of adopting new channels from governments perspectives. It is concluded that mobile apps with advantages such as cost-efficiency have potentials to move governments towards open government, but the current usage is still at an early stage and poses challenges to play a bigger role. Keywords: 311 service, mobile government, open government, digital divide

Experiences of Community Gardens Participants in Different Types of Gardening Spaces

Adrian Lue – M.A Candidate, Department of Geography, University of Toronto Dr. Tenley Conway, Department of Geography, University of Toronto, Mississauga **Keywords**: Community Gardens, Community Development, Urban Sustainability, Urban Greening Community gardens provide a number of personal, social, and community benefits for the members that attend them. Traditionally, these gardens are located on plots of ground in parks or on vacant land in downtown cores as well as suburban neighborhoods. However, rooftop gardens are becoming increasingly popular as alternative gardening spaces in areas where urban development has consumed viable greenspace. While rooftop gardens hold the potential to provide benefits similar to traditional on-the-ground community gardens, it is unclear if the experiences of participants are the same, as no previous study has explored the experiences of rooftop gardening and street level community gardeners simultaneously.

This research project focuses on the experiences of community gardening participants in suburban Mississauga and downtown Toronto, including both street level and rooftop gardens. Written surveys were distributed to seven gardens to gauge the benefits, concerns, and challenges that participants experienced in their respective gardening spaces.

Participants in street level suburban community gardens in Mississauga identified hobby provision, social engagement and access to healthy food as primary benefits of using their gardening space. Participants in Toronto's rooftop gardens experienced similar benefits, but responses seem to indicate that aspects of urban and environmental sustainability were important considerations for their involvement in their respective gardens. These and other comparisons between gardens experiences will be presented and the broader implications discussed

Title: Using the Tea Bag Index to characterize decomposition rate in restored peatlands

MacDonald, E., Gauthier, T., Elliott, J., Turmel-Courchesne, L., Touchette, S., Bieniada, A., Saraswati, S., Engering, A., Strack, M. (Department of Geography and Environmental Management, University of Waterloo)

Decomposition, the breakdown of organic material, is a key process for recycling nutrients within an ecosystem. The rate of decomposition is strongly regulated by environmental conditions such as temperature, water content and substrate availability. Peatlands characteristically accumulate organic matter due to low decomposition rates, but peatland disturbance alters local physicochemical conditions often resulting in loss of soil organic matter and emission of CO₂. While restoration can return peat accumulating function, traditional measurements of decomposition are time consuming. The Tea Bag Index is a simple standardized method to measure decomposition rates using commercially produced green and rooibos tea bags. Pairs of 150 tea bags were buried at peatlands used for peat extraction and disturbed by oil sand extraction (former well-sites) in northern Alberta, central Manitoba, and southern Quebec. At each site restoration activities had been applied and this restored site was compared to undisturbed peatland and where available, disturbed, unrestored sites. The tea bags were weighed before and after being buried for three months. Soil temperature at 5 cm, 10 cm, and water table data was collected from May to August. Comparison of decomposition rates among all locations found no significant difference between restored, unrestored, disturbed or undisturbed sites. However; comparison within locations found a statistically significant difference between the disturbed and undisturbed sites in central Manitoba, but was not found to be significant for the other locations. The data collected here will contribute to a collaborative global dataset of decomposition rates to measure the potential effects of climate change.

Keywords: decomposition, peatlands, landscape management

Evaluating retrievals of soil moisture from C-Band SAR to changes in vegetation across two growing seasons

Josh MacDougall, Aaron Berg (Professor/ Advisor - University of Guelph), Tracy Rowlandson (Research scientist – University of Guelph), Elené Ueckermann (MSc Candidate – University of Guelph), Jenelle White (MSc Candidate – University of Guelph)

Department of Geography, University of Guelph, Guelph, ON

Keywords: RADARSAT-2, Agriculture, Soil Moisture

Soil moisture estimates can have a significant role in monitoring and predicting extreme events such as droughts. Ground-based observations are useful but lack spatial distribution. Numerous studies have demonstrated the ability to estimate soil moisture using C-Band SAR. At C-Band, the

retrieval of soil moisture is highly impacted by vegetation growth. To understand the applicability of soil moisture retrievals during the growing season it is useful to demonstrate the accuracy of soil moisture estimates relative to vegetation parameters.

LAI and vegetation water content were monitored over several agricultural fields in 2015 and 2016. Soil moisture was monitored using an in-situ network across the same fields. RADARASAT-2 acquisitions obtained during the growing seasons were used to derive a soil moisture estimate at the field scale and were compared to the network sites. The estimated soil moisture product from RADARSAT-2 did not show a discernible relationship with the observed soil moisture. However, many of the RADARSAT-2 acquisitions occurred after significant canopy development, where it has been well documented that retrieval errors increase. To assess sensitivity of RADAR backscatter to vegetation growth, HV, HH, VV backscatter was compared to the vegetation parameters obtained from each field. The strongest relationships between the vegetation parameters were observed with HV. However, saturation of the backscatter signal occurred at approximately 2.5 kg m⁻² VWC and 2.3 m²m⁻² LAI. This highlights the need to establish the relationship between the backscatter and vegetation to determine when during the growing season RADARSAT-2 can be utilized for accurate soil moisture retrieval.

The Everyday Health Experiences of South Sudanese Canadians in Ottawa: A Feminist Political Ecology of Health Perspective

Katie MacPherson, M.A. Candidate, Geography and Environmental Studies, Carleton University

Amidst one of the longest civil wars in history, millions of Sudanese and South Sudanese have fled Sudan, seeking refuge in many countries around the world. Currently, there are almost twenty thousand of these immigrants and refugees living in Canada. Research suggests that despite access to health care, both psychological and physical health issues continue to mount within the South Sudanese diaspora. However, research in this area is still scant, and especially fails to account for the unique experiences of the South Sudanese, and how these experiences impact health. The main goal of this project is to explore why poor health persists in the context of life in Canada, and understand how it may be linked to the experience of migration. With the application of a feminist political ecology of health framework and the use of focus group and semi-structured interview methods, this project seeks to investigate the everyday experiences of South Sudanese Canadians in Ottawa, and their relation to experiences of health. Particular attention is paid to pre-migration experiences, migration routes, post-migration stressors, and the gendered dimensions of these experiences.

Key concepts: migration, health, gender, political ecology

Title: Soil rewetting ability on a transect of soil organic carbon with sand soil texture.

Author: Hida Manns, Trent School of the Environment, Trent University, Peterborough, ON <u>hmanns@trentu.ca</u>

The lack of water retention ability in sand soils also limits their ability to sustain soil organic carbon (SOC) limiting the chance for a range of SOC to become established. A transect of SOC was established from a range of land use on subsoil sand over an area of 50 m². The area was composed of 3 difference land uses over 25 years resulting in; 1) subsoil sand with light grass vegetation, 2)

an area that had been tilled and enriched with frequent compost mulch 25 years ago and then left to pasture for 10 years and 3) an area that was mulched for the previous 15 years for vegetables between rows of native grasses. Soils were sampled with a theta probe moisture sensor in the surface 5 cm at 1 m intervals in 3 continuous transects (~27 sample points) for soil water content (SWC) before and after ~1 cm of rain following hot dry weather in July 2016. Replicate soil cores were taken to 10 cm depth in each area for SOC measurement.. SWC (v/v) was significantly increased (p < 0.001) in the current garden area compared to the existing and restored pasture at both sampling times. The change in SWC following rainfall, averaged for each of the 3 areas, was exponentially increased with SOC levels (SWC = $0.0107 * SOC^{4.33}$, r² = 1). This study demonstrates how the SOC level changes with land use management and the influence of SOC on the water holding capacity of soil.

Keywords: Soil organic carbon, Soil water content, sand soil texture, land use management

Rural Community Conflict and Biosolid Facility Siting: Where are we now?

Sarah Mason-Renton¹ and Isaac Luginaah¹

1. Geography Department, University of Western Ontario

Keywords: Facility Siting; Rural Geography; Sense of Place; Waste Processing

When assessing techno-industrial developments it is important to consider how these industries are affecting residents' emotional geographies and changing sense of place. Rural communities are changing as exurban residents in migrate with differing expectations than members of the surrounding agricultural community and this is impacting residents' response to potentially noxious techno-industrial developments in their community that are also seen as being beneficial for the local agricultural economy. In the Township of Southgate, Ontario a regional biosolid (sewage sludge) processing facility went through a hostile siting process in 2011 – 2012 and became operational in 2013. This research explores residents' perceptions of and responses to the development of this facility and broader changes that have occurred in their community' and definitions of 'rural' in Southgate Township as well as further examining the impacts experienced as fallout from the contentious facility siting and development process and now its operational stage. This longitudinal work draws on theoretical constructs of rural sociology, sensual and emotional geographies and the pastoral rural landscape and is situated within the wider conceptualization of the risk society.

An Operational Winter Severity Index for Winter Highway Maintenance in Ontario, Canada

Lindsay Matthews*

Department of Geography and Environmental Management, University of Waterloo, 200 University Ave West, Waterloo, N2L 3G1, Canada. *Corresponding author E-mail: lindsay.matthews@uwaterloo.ca

Jean Andrey

Department of Geography and Environmental Management, University of Waterloo, 200 University

Ivan Minokhin

Department of Geography and Environmental Management, University of Waterloo, 200 University Ave West, Waterloo, N2L 3G1, Canada. iminokhi@uwaterloo.ca

Max Perchanok

Maintenance Branch, Ontario Ministry of Transportation, 301 St Paul Street, St. Catharines, Ontario, L2R 3M8, Max.Perchanok@ontario.ca

ABSTRACT

Snow and ice control programs are critical for the safe and efficient use of roadways in all winter climates. There is an increasing demand for tools that help road authorities to assess and communicate snow and ice control programs. Winter severity indices (WSI) that measure the severity of winter weather conditions as they relate to road maintenance practices are one tool that has been gaining increasing interest. The challenge is to develop a WSI that accurately explains temporal and spatial variations in road maintenance activities across diverse geographic areas. In this paper, a method for developing a province-wide WSI is described using a case study approach on the provincial highway system of Ontario, Canada. This methodology combines the use of expert knowledge and mathematical optimization to develop a WSI that assigns daily weather scores based on eight weather triggers and one warm weather adjustment factor. These daily scores are then aggregated to the 14-day period and are correlated to maintenance activities, as measured by equipment hours. When measured as equipment hours, the WSI for Ontario provincial highways has a strong fit with maintenance activity that occurred. Working at the 14-day level, the R² values for equipment-hours vary from 0.588 to 0.985 for the 20 maintenance areas over seven maintenance seasons. At the provincial level, fit improves further to between 0.959 and 0.989 over seven seasons. This study demonstrates the utility of a province-wide WSI and describes how a WSI can be developed for road authorities.

KEYWORDS

Winter Severity Index, Winter Road Maintenance, Weather, Transportation Planning

Author: Andrew McCartan Affiliation: Brock University

Title of paper: Politics that Party: Examining two alternative LGBT Pride events in Glasgow

LGBT Pride events worldwide are disruptive to the heterosexual norms constituting public space by making visible LGBT people with their demands for political and social acknowledgment and inclusion. While some LGBT people still view contemporary Pride events to be successfully continuing this challenge to normative heterosexual expectations in public space, there are others who do not. In Glasgow, queer activist group Free Pride formed to create an alternative event to Pride Glasgow's annual festival for the last two years. While Pride Glasgow continues to use its space to challenge heteronormativity in the way it sees fit, this paper argues that Free Pride is more concerned with challenging the normativity present within Glasgow's LGBT community. Seeing

Pride Glasgow's event as a depoliticized version of a more radical queer past, Free Pride works to create a more inclusive and political event space. By focusing on interviews with the key players in Free Pride, this paper will examine how the group critiques Pride Glasgow, and how this fits into academic discussions on homonormativity and commodification. Through examining how the two groups in Glasgow work to constitute their Pride spaces in light of their understandings of how space should be used to challenge normativity, this paper will argue for a more fluid understanding of Pride events that moves past the discursive binary of queer assimilation and transgression.

Keywords: queer, sexualities, festivals, public space

Examining initiatives to reintroduce Indigenous cultivation and management practices in State-led parks and protected areas

By: Samantha McGee, Jennifer J. Silver, and Robin Roth (Department of Geography, University of Guelph) smcgee@uoguelph.ca

Within British Columbia, there has been a recent emergence of new parks and protected areas under newly established park designations both federally and provincially. These parks are leading the implementation of Indigenous cultivation and management practices creating opportunities for agencies like Parks Canada and BC Parks to better balance ecological mandates with First Nations relationship building and reconciliation. However, the creation of new park designations raises the question of why these initiatives cannot be implemented within existing park structures. This research examines the motivations and associated challenges behind cultural reintroduction and reconstruction projects within state-led parks and protected areas in British Columbia and analyses the implementation and future potential of the clam garden reconstruction project currently occurring in Gulf Islands National Park Reserve (GINPR). Data was collected through participant observation and semi-structured interviews with Parks Canada and BC Parks staff members involved in cultural reintroduction projects across coastal parks and protected areas in BC.

Initial findings show that one of the key motivations for reintroducing Indigenous management practices is to proactively facilitate the return of communities to their traditional territories as well as to catalyze the (re)connection between First Nations elders and youth. Participants also stated that these initiatives help to meet the ecological integrity mandates of their parks, creating both social and conservation benefits. However, interviewees suggested that the structure of the Park(s) Act at the federal and provincial level may limit the further implementation of Indigenous cultivation and harvesting practices within state-led parks and protected areas. **Keywords:** State-led parks, Conservation, First Nations management practices, Park(s) Act

Reywords. State-feu parks, conservation, First Nations management practices, Fark(s)

Effect of biochar on soil health, greenhouse gas emissions and climate change resilience

Mechler, M. A., Oelberman, M. (Department of Geography and Environmental Management, University of Waterloo) Abstract:

While biochar as a soil amendment is not a novel concept, the addition of biochar into temperate agricultural soils represents a relatively new territory. Biochar is simply charcoal added to soil with the purpose of retaining and making moisture and nutrients accessible to plants, storing carbon, and increasing surface area for nutrient exchange and microbial growth (Koide, Petprakob, & Peoples, 2011). This project aims to investigate nutrient and biochar regimes in a traditional temperate agricultural setting. This project, located in Huron County, is currently the largest long-

term commercial farming biochar field trial and demonstration site in Ontario. Three differing treatments have been implemented, and replicated 3 times each. Each randomly placed replicate is carried out in a 10x10m plot with a 1m buffer from the border and a 3m border between plots. The first treatment consists of poultry manure sourced from the farm (6t/ha) and commercial nitrogen fertilizer (urea) (135kg/ha). The second treatment consists of the same manure (3t/ha) and biochar (wood source material)(3t/ha). The final treatment consists of manure (3t/ha), commercial fertilizer (urea) (135kg/ha), and biochar (3t/ha). The chickens, from which the manure is sourced, have been fed a ~1% charcoal feed. Therefore, the manure offers a source of nutrient saturated biochar. Data is presently being collected and analyzed to assess the effect of biochar on nutrient levels, soil health (physical and ecological), greenhouse gas emissions, and long-term soil carbon alterations. The hope is that these finding might inform farmers of new economic opportunities. (245 words).

Key Words: Biochar, Carbon Storage, Soil Health, Greenhouse Gas Emissions, Soil Amendment

Koide, R. T., Petprakob, K., & Peoples, M. (2011). Quantitative analysis of biochar in field soil. Soil Biology and Biochemistry, 43(7), 1563–1568. doi:10.1016/j.soilbio.2011.04.006

Use of photosynthetic pigments to track hydroecological conditions of lakes in the Peace-Athabasca Delta, a floodplain downstream of major energy projects

Eva Mehler¹, Casey Remmer¹, Roland I. Hall¹, Brent B. Wolfe², Joshua Thienpont³ & Jules Blais³ ¹Department of Biology, University of Waterloo, Waterloo, ON ²Department of Geography and Environmental Studies, Wilfrid Laurier University, Waterloo, ON ³Department of Biology, University of Ottawa, Ottawa, ON

The Peace-Athabasca Delta (PAD), located in northeastern Alberta, Canada, is the world's largest inland freshwater boreal delta and is internationally renowned for its high ecological value und cultural significance. It consists of numerous shallow lakes that provide important habitat for a variety of flora and fauna. This ecosystem has been increasingly exposed to various potential anthropogenic stressors, such as climate change, hydroelectric development and oilsands production. The cumulative effects of these stressors have the potential to alter the natural state of the delta's aquatic ecosystems. As part of developing an innovative long-term hydroecological monitoring program for lakes in the PAD, we are using periphytic algal pigments to track changes in ecological status. In spring 2015 and 2016, we deployed artificial substrate samplers for one-month duration in 62 strategically selected lakes that span the hydroecological gradients of the delta. Pigments will be quantified using High Performance Liquid Chromatography (HPLC) and relations will be explored with lake hydrology (water isotope composition), water physico-chemistry and contaminant concentrations (metals, PAHs) using multivariate approaches. Results will be communicated to multiple stakeholders including Parks Canada, First Nations community-based monitoring programs, federal and provincial government agencies and industry.

Key words: periphytic algal pigments, biomonitoring, high performance liquid chromatography (HPLC), lake ecological condition

Title of the Paper: Barriers to Renewable Energy Development in Newfoundland and Labrador: A Case Study of Wind Energy Applying the 'AKTESP' Analytical Framework

Nick Mercer

Division of Social Science Grenfell Campus, Memorial University of Newfoundland

Affiliation of the Author: Department of Geography and Environmental Management, University of Waterloo, n2mercer@uwaterloo.ca

Abstract: Despite vast research on the need to transition to renewable energy (RE), fossil fuels remain the world's primary energy source. This study contributes to the energy transition (ET) literature by identifying barriers to RE development in Newfoundland and Labrador (NL). Applying Trudgill's 'AKTESP' analytical framework, the study asked: in a provincial context, (1) what barriers exist to wind energy development (W.E.D), (2) what are the potential benefits of W.E.D, (3) based on barriers identified, which policy measures would facilitate ET? Seventeen expert interviews were conducted and content analysis was applied using NVIVO software. A large majority of respondents (65%) classified the current state of W.E.D in NL as 'unfavourable'. The most frequently reported barriers were political (71% of respondents), economic (65%), and knowledge- related (53%). Potential benefits of W.E.D were economic, environmental, and societal in nature. Based on the findings, an ET framework was developed, consisting of seven policy recommendations.

Key words: renewable energy, barriers, transition, policy, Newfoundland and Labrador

Title: Governing the Phoenix Islands Protected Area: The Politics of Decision-Making

Author: Mitchell, Lillian

Affiliation: Department of Geography, University of Guelph

Large marine protected areas (LMPAs) greater than 100,000 km² have recently proliferated as a means of ocean conservation. Some scholars attribute this proliferation to the desire of states to meet the Convention on Biological Diversity Aichi Target 11 of protecting 10% of the ocean by 2020. However, Target 11 also calls for protected areas to be effectively and equitably managed. While the governance processes of smaller MPAs have been well defined, LMPAs are unique in both form and function and less is known about how to govern them effectively. In attending to this gap, this research explores the governance of LMPAs through a case study analysis of the Phoenix Islands Protected Area (PIPA) in Kiribati, one of the oldest established LMPAs. Interviews were conducted in summer 2016 with 45 actors who have knowledge of PIPA's governance structure and its outcomes.

Preliminary findings reveal two key themes. First, despite a collaborative governance structure in which the LMPA is jointly governed by the government and international partners, there has been a perceived lack of participation in Kiribati. Second, a recent election has led to questions regarding PIPA's 'unfulfilled promises' of social and economic benefits. Popularly called Kiribati's "gift to humanity", PIPA was expected to spur international action on climate change and generate revenue for the people of Kiribati. However, after over a decade the local perception is that while PIPA has been celebrated as a success for conservation, it has not been a social success.

Keywords: large marine protected areas, Kiribati, Phoenix Islands, oceans governance.

The use of military technologies along the US-Mexico border: the dehumanization of undocumented migrants.

Monica Socorro Romero Meza (Department of Geography and Environmental Studies, Wilfrid Laurier University)

The US–Mexico border has been characterized as a source of insecurity and threats for American society. Most recently, it has become a site of militarization in which a concentration of border agents and military technology has covered the physical territory. This practice not only shapes the visual landscape, the local economy and the social norms, but also opens a moral question on how migrants are being exposed to raw conditions, leading to them being the subjects of abuses, human rights violations, and even death.

This presentation will explore the relation between ethics and technology by analyzing the US-Mexico undocumented migration. It will mainly focus on high-level military techniques as factors that enable migrants to be perceived only as targets and not human beings. The results of the research are based on the analysis of both perspectives: US Customs and Border Protection policies, and the humanitarian view of civil organization leaders in the field. By describing and exploring both, it is shown how immigrants suffer from dehumanization and criminalization from the US CBP policies, but also how several organizations offer them humanitarian services guided by their moral responsibility to help those in need.

Keywords: US-Mexico border, border security, militarization, high-level technology.

Mapping a large-scale dieback of mangroves in Australia's Gulf of Carpentaria using a Landsat 8 time series

Hailey S. Morning¹, Duncan J.E. Hill¹, John M. Kovacs¹, Norman C. Duke²

¹ Department of Geography Nipissing University, 100 College Drive, North Bay, Ontario, P1B 8L7, Canada

² TropWATER Centre, James Cook University, ATSIP Building 145, Townsville, Queensland, Australia

Following the observations of severe mangrove loss in Australia's Gulf of Carpentaria by concerned local residents, a joint investigation was conducted to identify both the date of inception and the extent of the wetland dieback. A preliminary examination of Landsat imagery showed that the dieback of mangrove forests was in fact severe and wide-spread being present across 1000 km of shoreline stretching from the Roper River Estuary in the Northern Territory to Karumba in Queensland. To quantify the amount of mangrove forest loss, a multi-temporal change detection using Landsat 8 imagery was performed. By identifying areas of significant NDVI loss between April 2015 and April 2016, it was determined that over 7000 ha, or 6% of the coastal forest, was impacted by the dieback event. This loss appears to coincide with extreme weather events believed to be associated with global climate change.

Decarbonization Waterloo Region: Participatory learning in a local energy transition

Scott David Morton (Presenter) - University of Waterloo

Abstract: In 2015, global leaders agreed at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change that urgent, collaborative action on climate change is not only an environmental and social imperative but also represents a significant economic opportunity. The transition to a decarbonized global economy presents a challenge of unprecedented scale, yet a growing body of research identifies local level energy transition processes as an effective locus for action and change. There is an identified lack of systematic learning about transitions at the municipal level, and this presents an ideal opportunity to address it through collaborative cross-sectoral research. This presentation analyzes the case of Waterloo, Canada, through the lens of socio-technical transitions to assess potentially innovative pathways to a more sustainable (low carbon) future. In particular, we examine a new participatory process called Decarbonization Waterloo Region, a forum within which local stakeholders, scholars, and practitioners can envision low carbon futures and negotiate paths toward them. Focus groups and pre/post forum surveys will deliver insights into the effectiveness of this process, the partnerships and policies at various levels of government that might accelerate this sustainability transition, and the roles that SMEs and local civil society actors can play in driving innovation. Ultimately, we identify practical lessons that will advance energy policy-making in Canada at the local level and contribute to the nascent body of Canadian and international literature on transitioning to a low carbon economy.

Measuring the Effectiveness of an Outdoor Education Program on High School Students' Knowledge, Attitudes, and Behaviours Towards Climate Change – *Climate Change S.O.S.* – *Save Our Syrup!*

Dr. Brenda Murphy, Professor, Wilfrid Laurier University <u>bmurphy@wlu.ca</u> Mr. Bryce Gunson, Project Manager, Wilfrid Laurier University <u>bgunson@wlu.ca</u>

Key Words - Climate Change; Environmental Attitudes; Environmental Behaviors; Citizen Science

Climate Change S.O.S. – Save Our Syrup! is a program developed by the *Resilient Communities Research Collaborative* (led by Dr. Brenda Murphy from Wilfrid Laurier University) that brings students to the Mountsberg Conservation Area (Campbellville, Ontario) where they explore a working maple sugar bush. Students monitor the health of the sugar bush, contributing to an ongoing citizen-science data set. They learn about the threats faced by the sugar maple, and examine the economic and cultural impact of the potential loss of these trees. A knowledge mobilization assessment project utilizing pre & post-test surveys measured program effectiveness on the students' knowledge, attitudes, & behaviours towards climate change based on the research question "To what extent does sharing knowledge about the impacts of climate change about sugar maple ecosystems and maple syrup influence the participant's knowledge, attitudes, and behaviours towards climate change? Participants in this study (n=517) included grade 9-12 students from seven secondary schools in the Halton district school board in the cities of Oakville, Burlington and Georgetown (Ontario). Results indicate positive changes in knowledge of climate change & maple syrup, and positive changes in students' attitudes regarding their ability to lessen their impact on climate change. Although we didn't see a statistically significant change in behaviour towards climate change, the literature indicates this is the hardest attribute to change. Overall, feedback

from both students and teachers has been extremely positive. The program continues to operate thanks to funding from SSHRC, OMAFRA, the Canadian TREE fund, Wilfrid Laurier University and Conservation Halton.

Title: Play Deserts as Health Inequities? Mapping Playground deserts and socioeconomic deprivation in Kingston, ON **Authors**: <u>Allison Murray</u> & Jeffrey R. Masuda, Queen's University

Introduction: Playgrounds are an important feature of the urban landscape that contribute to both the physical activity and social development of children, but there may be inequities in their accessibility related to both distribution and quality. This study sought to develop a concept of playground deserts that takes into account both dimensions and to determine whether inequities exist in relation to socioeconomic deprivation. **Materials and methods:** All playgrounds within urban Kingston, ON were assessed using a "Seven C" score for playground quality and entered into a GIS. 800m buffers clipped to arterial roads were assigned to playgrounds as a proxy for reasonable accessibility, with diameters penalized according to the 7C score (200m/quintile). Playground deserts were defined as the area of residential zoned land falling outside of buffers. The proportion of residential land area in play deserts relative to total area was calculated for each of five socioeconomic deprivation quintiles (ONMarg), revealing a distinct pattern of playground desert inequity in Kingston. Conclusion: Playground deserts exist to different degrees across all deprivation quintiles in Kingston. Further research will need to be conducted to determine the impacts of playground desert inequities on playground accessibility and behaviour, that is, if living in play deserts disproportionately affects the experiences of play among children living in in higher deprivation areas relative to more affluent neighbourhoods.

Keywords: playgrounds; playground deserts; built environment; children's health

Corresponding author: Allison Murray, allison.murray@queensu.ca

The Artists of Peterborough

Stephanie Murray, Brock University

The intent of this project was to problematize Richard Florida's concept of the "creative class"—as well as the uptake of Florida's theories by municipal policymakers—by focusing on the locational preferences of visual artists living and working in the municipality of Peterborough, Ontario. As the literature on creative workers suggests that creative workers are motivated to locate in particular places based on a range of different factors, face-to-face semi-structured interviews and asynchronous email interviews were conducted with a sample group of 13 of Peterborough's visual artists—seven urban and six rural—in order to discover why they were living in this particular municipality. While Peterborough's affordable cost of living and proximity to Toronto were valued by participants, the municipality also presented unique challenges for visual artists seeking to sell their work. Furthermore, contrary to what the literature on creative workers suggests, the majority of artists who participated in the study were not motivated to locate in Peterborough by opportunities for professional networking, or by aspects of the natural or built environment; instead, more than half of the participants came to live in this municipality because they were accompanying spouses or family members who were moving to the area. The decisions of—and unique challenges faced by—Peterborough's artists suggest that a qualitative approach to

understanding the location decisions of creative workers in particular contexts is valuable, especially for municipalities who seek to implement policy decisions that will help to attract workers in the so-called "creative class."

Keywords: Creative class, Richard Florida, municipal policy, urban planning

Title of the Paper:

Analysis of habitat restoration using Remote sensing and GIS: A Case Study of Northwest Beach, Point Pelee National Park, Ontario, Canada.

Authors:

Nayak, P., and Byrne, M-L. (Department of Geography and Environmental Studies, Wilfrid Laurier University, Waterloo.)

Abstract

Point Pelee National Park has undergone significant ecological and infrastructural changes in the past decades. This has resulted in major modifications in the park's diverse ecosystem, which is home to several rare species of flora and fauna, and their critical habitats. A number of important management challenges have emerged, including conservation of the endangered Five-lined Skink (Eumeces fasciatus) through restoration of ecologically disturbed sand dunes and Carolinian vegetation that provided critical habitats for this species. This paper aims to examine the process of Five-lined Skink habitat restoration by evaluating the status of sand dune formation and forest vegetation change in Point Pelee. Vegetation change detection using two series of aerial photos was undertaken to analyse forest cover and species. Dune vegetation species diversity, grain size distribution and volumes of sand supply piles were calculated to evaluate the status of sand dune restoration. Shannon diversity Index and Simpson's diversity Index were calculated based on the samples collected. Grain size distribution was calculated based on mean, median and standard deviation (sorting) of the sand samples. Grain size distribution indicated that samples from many of the sand piles contained significant amounts of both clay and pebble sized grains making it unfavourable for reworking by the wind, and resulting in no significant contribution to dune formation. Given this result we propose alternate management strategies for dune restoration in Point Pelee.

Key Words: sand dune, change detection, restoration, Five-lined skink, habitat

Neglected Tropical Diseases (NTDs) as the classic example of inequality and wellbeing in sub-Saharan Africa

Ochola, E.A. and Elliott, S.J.

Department of Geography and Environmental Management, University of Waterloo

Neglected Tropical Diseases (NTDs) disproportionately affect the poorest and marginalized populations living in the developing world, with an estimated 50% of the infections in sub-Saharan Africa. NTDs have a substantial impact on morbidity and mortality, and cause developing economies billions of dollars every year in lost revenue by limiting educational opportunities, interfering with labor productivity, and compromising on the wellbeing of individuals and families. Lack of access to clean water and sanitation, improper housing and poor health care facilities contribute to the high rates of infection. It is for this reason that NTDs are found almost exclusively

in populations living in impoverished areas and are absent in populations that enjoy high standards of living.

The association between poverty and NTDs seems to be well documented. However, it remains unclear how structural factors associated with inequalities contribute to the persistence of NTDs within the broader context of infectious disease.

The main purpose of this research will be to explore NTDs from these social perspective by examining various factors that lead to inequalities and how these factors propel the cycle of poverty in the broader context of social health and wellbeing in sub-Saharan Africa.

I will demonstrate that equity in structural systems is important for the reduction of the global burden of NTDs and enhancement of societal health and wellbeing.

Keywords: Neglected Tropical diseases, Inequalities, Wellbeing, sub-Saharan Africa

Health-Wellbeing Nexus: An Ecological and Life Course Perspective in Theorization and Conceptualization of Health and Wellbeing

Presenter: Elizabeth Opiyo Onyango (Student) Supervisor: Susan Elliott Institution: University of Waterloo School: Geography and Environmental Management

Abstract

The concepts of health and wellbeing are important in human life and their usage can be traced back in human history. Limited conceptualization and theorization of these concepts have restricted our understanding and knowledge. But, the current emergence of a broad view of wellbeing in academic and policy literature has countered this limitation. Although the concepts of health and wellbeing have been used interchangeably in health policy and academic literature, as well as health care service provision, it has become obvious that the concepts are not synonyms. Drawing from literature within and outside health geography, I discuss the relationship between health and wellbeing as measurable constructs. My primary goal is to demonstrate the role of theory in conceptualization of health and wellbeing. As interest in broader conceptualization of wellbeing beyond health grows, there is a greater necessity to be clear about the operationalization of these concepts. Consequently, the study of health and wellbeing requires a clear theorization if we are to adequately explain health patterns geographically and historically. The theories that embrace the ecological and life course perspectives such as the eco-social model provides such kind of frameworks. The broader knowledge on health and wellbeing is necessary in the identification of pertinent intervention areas and evidence based policy and decision making.

Key words: Health, wellbeing, ecological, life course, theorization

Title: "We can't stay poor": rural youth motivations to engage in artisanal small-scale mining in Ghana.

Lydia Osei¹, Godwin Arku¹ and Isaac Luginaah¹

¹ Western University, Department of Geography

Abstract

Artisanal small-scale mining (ASM), a low-tech, labour intensive mineral extraction and processing activity is not a new phenomenon in the developing world. However, recent expansion of the sector

and the associated challenges makes it a pressing issue that lie on discussion tables among governments. More especially, increases in the number of youths trooping to ASM mines has become a great concern in the development scholarship. In Ghana, rural youth are increasingly choosing ASM as a major livelihood. What is needed in understanding this trend is the ability of governments and researchers to examine factors underpinning youth engagement in the sector. Data was collated from youth miners in the Upper East Region. Using the data from in-depth interviews with 45 youth miners, this study investigated what the motivations of youth were and how these influenced their choice of livelihood. Our results show that the increase in ASM activities is majorly propelled by dire poverty; nonetheless, youth are determined to escape the poverty trap and this they do by engaging in ASM. The youth explained by giving the various ways they experience poverty to include their lack of education or struggle to remain in school and the limited employment opportunities they have.

Key words: youth, poverty, motivations, artisanal mining

Re-estructuration économique et ses effets espaciaux à Porto Alegre, Brésil.

Joel Outtes,

GEST- Group d'études sur les societies et les territories.

Universidade Federal do Rio Grande do Sul.

Resumé: Ce travail investigue les effets de la re-estructuration économique dans la RMPA-Région metropolitaine de Porto Alegre au Brésil. Il se concentre dans les changements du marché de travail et l'occupation du territoire metropolitain. Il recherche des developpements tels que la constitution des systemes productives centraux organisée de façon réticulaire, le policentrisme du fonctionement de l'estructure metropolitaine et la proliferation des equipements urbains lesquels ont eu un effet dans l'estructure et l'image urbaines.

Mots clés: Re-estructuration économique, marché de travail, Porto Alegre, région metropolitaine.

Le réseau des réseaux urbains: La géographie de l'Internationale Urbaine (1851-aujourd'hui)

Joel Outtes,

GEST- Groupe d'études sur les sociétés et les territories.

UFRGS- Universidade Federal do Rio Grande do Sul.

Resumé:

La recherche investigue le réseaux de (pour le moment) 27 institutions urbaines internationales se concentrant dans l'histoire de deux institutions, l'IFHP-International Federation for Housing and Planning et l'UCLG- United Cities and Local Governments, ses caracteristiques, reseaux de
participants, changements dans ses politiques ainsi que le role des pays, institutions, groupes et individus dans ces décisions, politiques et production intellectuelle. L'IFHP à eté crée comme International Garden-Cities Association (Association international des villes-jardins) en 1913 et existe aujourd'hui encore. L'UCLG à eté crée comme IULA-International Union of Local Authorities (Association international des villes) en 1913 aussi et existe encore. Le travail investigue le role de ces institutions dans le fluxe international des pensés et pratiques de la planification, et l'aménagement urbain ainsi comme ses roles dans la constitution d'une communauté internationale d'urbanistes. Une des questions à être discutée c'est jusqu'à quel point des expériences locales, regionales et nationales en habitation, planification et aménagement ont eté adoptées dans certains périodes par ces institutions. Dans une autre direction, la ressonance ou influence de certaines idées et politiques de l'IFHP et l'UCLG dans des experiences locales, regionales et nationales en habitation et des domaines ayant un rapport va être explorée.

Mots clés: institutions internationales, planification, diffusion d'inovation, habitation

Paper Title: The Rise of the Neoliberal City: Condominium Development and Toronto's CityPlace

Author: Rachel Phillips, University of Toronto Department of Geography and Planning (MA Human Geography program)

Abstract:

Condominium developments have become ubiquitous features of Toronto's urban landscape, emerging in disinvested neighbourhoods, former industrial sites, and defining entirely new neighbourhoods. This paper examines Toronto's condominium boom in the context of the city's increasingly neoliberal urban governance strategies. The development of City Place – a 44-acre condominium project located near Toronto's waterfront on former railway lands – is used in this paper as a case study that highlights how a neoliberal conception of the roles of government and the private sector has shaped condominium development in Toronto. Focusing on how City Place was planned, financed, and then sold to particular demographic groups in Toronto, this paper attempts to illustrate who benefits from the city's condominium boom, who loses out, and how public and private interests work together to produce an increasingly privatized and commodified urban landscape.

Keywords: condominium development, urban governance

Exploring the use of social values to facilitate public participation in highly regulated environmental management decisions

Philpot, S¹., Hipel, K^{2,3,4}., Johnson, P¹.

¹Department of Geography and Environmental Management. University of Waterloo, Ontario Canada. ²Department of Systems Design Engineering. University of Waterloo, Ontario, Canada. ³Centre for International Governance Innovation. Waterloo, Ontario, Canada. ⁴Balsillie School of International Affairs. Waterloo, Ontario, Canada.

Public participation is a key feature of environmental management in democratic governments. It has received support internationally through the UN-ECE Aarhus convention (1998) and The Hague Declaration (2000). At the national and sub-national scales, public participation is formalized in the Impact Assessment process. As a diverse citizenry increasingly takes its seat at the table, there is a growing need to integrate a variety of perspectives and priorities into formal decision-making practises. Institutions, such as non-governmental organizations (NGOs) serve to facilitate the inclusion of multiple stakeholders; however, more direct forms of participation at the local, or even individual level, must contend with perceptions that private citizens lack the expertise to understand and evaluate risks in complex environmental issues. This is particularly true in domains that are subject to regulatory oversight. In these cases, the need for knowledge of regulatory restrictions, and concern regarding liabilities poses a further constraint to citizen involvement in the development and evaluation of management alternatives. Developing participatory methods that focus on the two-way communication of perceived social values, as opposed to transferring knowledge, offers new opportunities to link citizens and formal decision- makers. Drawing upon insights from psychology, geography, and the decision sciences, we present the theoretical foundations for our research regarding the use of interactive participatory modeling to support the integration and evaluation of citizen and expert perspectives in formal decision-making contexts. Moreover, we identify key datasets that can be collected using this approach, and its projected contributions to multiple participant decision-making in environmental management.

Keywords : Environmental Management, Participatory Modeling, Values, Public Participation.

Development and Evaluation of a Generalized Online Spatial Argumentation Platform

Pierre, J. (Department of Geography, Ryerson University) Supervisor: Rinner, C. (Department of Geography, Ryerson University)

Online argumentation platforms enable groups to share information in a centralized database to gather information related to public works projects, planning and research projects. Argumentation maps provide the ability to link geographic objects to each other using conversational or logical connections. Available argumentation maps have significant technological barriers to use and may not offer features required for data access that have been identified in the literature. The purpose of this research is to create a data model and application architecture for an extensible online argumentation map and to evaluate it as a platform in two naturalistic use cases. The use cases are designed to demonstrate that unassisted users are able to interact with the system as effectively as users who are obligated to use it and are assisted through the process. The two use cases had similar statistics for user participation and content. Some users intuitively connected geographic objects to logical arguments, demonstrating the effectiveness of the data model and user interface. Based on the observed user participation rates and the degree to which users link spatial objects to conversational elements, we conclude that the data model and architecture are successful at providing an online argumentation map platform.

Keywords: web GIS development, argumentation maps,

Author: Stephanie Pike

Abstract: In a world where per capita consumption and population are on the rise and natural resources are decreasing, the value of clean energy is becoming undeniable. Although clean energy has the potential to support much of human life on Earth, there are many environmental and economic limitations. While environmental challenges exist for all sustainable energy sources in all locations, northern locations face unique challenges and limitations. This report evaluated the capability of northern communities to access and utilize wind turbines, solar panels and geoexchange systems as sustainable energy sources. The evaluation was based on available energy (e.g. sunlight, wind), costs (capital and maintenance), and carbon/ecological footprints. It was concluded that wind is most viable year round, solar is most viable during the summer months and geoexchange systems are viable in most northern locations. These findings were applied to two case studies (Whitehorse, YT and Inuvik, N.W.T.).

Keywords: Northern Canada, Energy, Sustainability

Review of data collection methods for post-harvest tillage residue assessment

Neal Pilger^{*1,3}, Aaron Berg¹, Renato Pardo¹, and Joshua Antinolfi², ¹Department of Geography, University of Guelph ²Department of Geography, Brock University ³Pilger Geospatial Inc./Profile Geomatics, St Catharines, ON *Corresponding Author: npilger@uoguelph.ca

Abstract:

The increase in temperature and precipitation variability as result of a rapidly changing climate has led to the adoption of conservation, and no tillage land management practices in favour of conventional post harvest field management. Such methods have shown, through a reduction of soil disturbance, decreases in weathering, erosion, nutrient loss, and carbon release to the atmosphere. Additional benefits of employing Best Management Practices (BMPs) that focus on soil health, includes a reduction in chemical herbicide/pesticide use, fertilizer application, and other soil augmentation. While orbital remote sensing platforms have been widely used in the monitoring of specific land use management practices in agriculture in this province, accurate ground observations are required for "training" any classification algorithm or index for quantifying the percentage of farms which employ either conventional, conservation, no-till, or cover-crop post harvest practices. This project aims to describe and evaluate the use of several novel techniques to facilitate accurate assessment of post harvest land management as carried out in Southern Ontario, Canada.

Keywords: Tillage Residue; Agriculture; Remote Sensing; GIS

Emergent technologies in Precision Agriculture / Viticulture

Neal Pilger^{*1}, Mike Duncan², Joshua Antinolfi³ ¹Department of Geography, University of Guelph; Pilger Geospatial Inc./Profile Geomatics ²NSERC IRCC in Precision Agriculture & Environmental Technologies, Niagara College ³Department of Geography, Brock University *Corresponding Author: npilger@uoguelph.ca

Abstract:

Precision agriculture is becoming common practice for grain and fruit/vegetable producers around the world. Implementing new technologies to monitor soil/surficial characteristics, through to targeted irrigation and pest management, to canopy health assessment in planning harvest schedules, is increasing productivity and reducing costs associated with agriculture management. This project will examine the use of emergent technology in precision agriculture applications, notably the use of in-field micro-meteorological / weather monitoring stations, remotely operated surface rovers, and UAVs. Working together in near-real time, these three technologies have been shown to provide invaluable information as to the current conditions in any field at any particular time. This project will explain how such technology, opens the doors to new opportunities in precision monitoring of viticulture crops, both in monitoring growth and yield via photosynthetic rate, and in the detailed examination of topographic profiles which influence air transfer, temperature, and humidity below the canopy and aid in the identification of optimal, within field placement of crop types.

Keywords (4): Drones; Remote Sensing; Precision Agriculture; Climate Change

LiDAR derived DEM for improving hazards and geomorphology analyses of river mobility

Saied Pirasteh* and Jonathan Li Department of Geography and Environmental Management, University of Waterloo, Waterloo, Canada s2pirast@uwaterloo.ca

Abstract

Remote sensing conventional methods, such as photogrammetry and satellite images can derive Digital Elevation Models (DEMs) with a moderate resolution. These techniques have challenges in investigating hazards and river mobility with a high quality of pixels of a DEM. However, Light Detection And Ranging (LiDAR) of high-resolution DEM has tended to be promising in an evaluation of the changes. Because LiDAR approach provides a surface detailed information as compared to the previous studies and traditional methods despite from limitations. This poster presents an improved understanding of susceptible landslide hazards as well as river mobility. The Zagros Mountains in Iran are greatly influenced by structural geology, tectonics, and bedrock lithology, and the courses of major rivers (River Karun and River Dez). The LiDAR high-resolution data is used to create a DEM of the study area. This study identifies potential hazard areas, and river responses were investigated using an integration of LiDAR, geomorphology, and a field survey to study the tectonic signatures. The study findings reveal that in the Zagros Folded Belt (ZFB) with rugged topography is susceptible to landslides wherein the Khuzestan Plains the river systems were found to be mobile and able to respond, both laterally and vertically, to the active tectonics. In the ZFB, we found that the Dez river is responded by landslides that are induced by the tectonic activities, and it keeps changing the movement direction of the river followed by structural features such as faults, folds, and lineaments.

Keywords: LiDAR, Zagros Mountains, DEM, River mobility, Geomorphology, Hazards.

The Social Disorganization of Intimate Partner Violence

Anthony Piscitelli Doctoral Candidate Geography Wilfrid Laurier University

Abstract:

A number of theories offer specific explanations for the causes of intimate partner violence (IPV). However, these theories do not adequately consider the impact of geography as it related to IPV. Recently, scholars have begun to recognize the connections between geography and IPV. Social Disorganization Theory primarily explains crime in communities as a consequence of economic disadvantage, insufficient informal social control, lack of collective efficacy and family breakdown. SDT is typically used in the context of property crime and public violence. Literature incorporating SDT with IPV is only recently emerging. Through a critical review of the SDT literature as it related to IPV a concept map will be presented. The concept map will offer insights into how neighourhood dynamics influence IPV and raise questions for further study.

Using values-association of space and place to (de)legitimise violence conducted in the war on terror.

Rebekah K. Pullen, Independent Researcher MA Global Governance, Balsillie School of International Affairs, University of Waterloo

Keywords: Space and Place, military, values, rendition

The "image" of the modern, Westphalian state is undergoing a retrenchment of ideals of state power, borders, and biopolitical methods of global governance. Operationally defining space as linked with territory, it is like a "container," and place is space that is infused with meaning, particularly by those residing within. Values attributable to a place are more respected than those that exist *supra*-space, and a re-emphasizing of state-as-place strongly situates 'us' and 'other' as distinct and divided by boundaries of values as well as geography. Within the context of the "war on terror" the United States (US) is, by rhetoric and other means, the defining actor of this conflict. Through the legal arrangement of opportunities for citizenship in exchange for non-citizens' military service, the US legitimizes the violence enacted on behalf of not only its laws, but of those values fundamentally universal, yet re-interpreted as distinctly American and values-of-place. Conversely, the US actively delegitimizes Islamic extremists fighting for *supra*-space values, meant to be universal and not attributable to a particular place but to all space: a universal Islam. As Westphalian states maintain the vestiges of traditional sovereignty, values that cannot be assigned to the map are considered inherently non-legitimate, and therefore non-legitimate reasons to fight. This makes it systemically acceptable to entirely remove the legal personhood of these actors, such as by labelling them "enemy combatants," and allowing for extraordinary rendition. Subsequently, their bodies are rendered non-legitimate through *extra*-legal means in the context of global citizenship, border sovereignty and belonging.

Evaluating the Opportunities to Develop Organic Agriculture On the Governmental Level

Danshu Qi PhD candidate Environment Faculty, University of Waterloo

The achievements of organic agriculture in treating the earth, improving healthy diets, enhancing farmers' livelihoods and so on contribute to the higher attention to and the expanding of organic agriculture worldwide. However, on the regional and operational level, the launch and development of organic agriculture not only depend on individual behaviors and ideology that values the obvious great effects of organic agriculture, but also subject to the political or commercial regimes that concern group interests. This study takes the experiences of developing organic agriculture in Nanjing, China as the example to explore governments' involvement in this sector, including stateowned farm companies, large-scale and small-scale private farms, and other types of farm businesses (e.g., agrotourism). The links between governments and farms are sorted into three categories of direct financial subsidies, supporting programs in terms of production material supplement, farming technique, and marketing, and the last of land transfer. This study argues first that Chinese governments hold an intensive appearance in the organic agriculture sector by controlling the productive materials and regulating the market. Second, large-scale farms are preferred by the governments when they deliver policy supports to organic agriculture. Third, the space for conducting organic agriculture independently is limited to small scales and exclusive to the elites. Traditional small farmers, though frequently engage in organic farming, are less possible to in charge of promoting organic agriculture under the current political context.

Keywords: organic agriculture, government involvement, land transfer

Identifying the common geographical pattern of crime and health: Applying a Bayesian shared component model to analyze violent crime and attempted suicide in Waterloo Region

Matthew Quick (School of Planning, University of Waterloo) Jane Law (School of Planning; School of Public Health and Health Systems, University of Waterloo)

Past research has suggested that the geographical variations in crime and health result from the same social factors. In particular, high levels of violent crime and attempted suicide are both hypothesized to occur in neighbourhoods with low collective efficacy, often measured through weak social ties and low informal social control, and in neighbourhoods with high residential instability. However, the degree to which neighbourhood-scale crime and health exhibit similar geographical risk patterns has not yet been explored. This research applies a Bayesian shared component model to analyze violent crime and attempted suicide at the small-area scale in the Regional Municipality of Waterloo, Canada. Accounting for the simultaneous influence of residential mobility on violent crime and attempted suicide, this research differentiates three geographical risk patterns; common (or shared) risk for both violent crime and attempted suicide, residual risk for violent crime and attempted suicide. Results provide empirical evidence that violent crime and attempted suicide are similarly clustered in the urban environment and broadly highlight the comprehensive influence of neighbourhood social contexts on a variety of health and social outcomes.

Keywords: spatial analysis, crime, health

Title: Essex County Agri-Tourism: Exploring Regional and Farm-Level Diversification **Authors:** Heather Reid (Geography Department, University of Guelph); Dr. John Smithers (Geography Department, University of Guelph)

Keywords: agri-tourism; Essex County; farm diversification; rural tourism **Abstract:**

The character of many Canadian rural regions is changing rapidly as farms continue to become larger and more specialized and new (ex)urban actors influence rural economies with new expectations of rural space. Tourism has emerged within Essex County, Ontario as a tool to adapt to this changing character. Its position within a designated wine appellation is being leveraged by the area's Destination Marketing Organization (DMO) to shape perceptions and increase tourism visibility. As tourism is being pushed to a more prominent position within the County's brand, farmers are provided opportunities to capitalize on increased visitation and an evolving perception of the region. Considering this regional context, this research aims to explore the role of agritourism in farm-level diversification and as a feature of the regional economy. To accomplish this, document analysis was conducted alongside interviews with agri-tourism providers (both farmers and vintners) and DMO representatives. The dominant narrative emerging from analysis is one of developing a tourism destination. While vintners actively collaborate to co-create a wine destination with the help of the DMO, farmers who have diversified into agri-tourism provision are more likely to work in silos and cultivate a personal niche without regard for a regional brand or destination creation. Though tourism promotional material emphasises the agricultural bounty and emerging beverage economy, it is questionable if farmers are actively buying into or are aware of this potential tourism opportunity. This research contributes to an understanding of Canadian farm diversification, particularly within the context of an emerging tourism destination.

Widespread drying of the Peace-Athabasca Delta, Alberta, Canada

Remmer, Casey (1) (crremmer@uwaterloo.ca), B.B. Wolfe (2), R.I. Hall (1) (1) Department of Biology, University of Waterloo, Waterloo, Ontario N2L 3G1 (2) Department of Geography and Environmental Studies, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5

Keywords: Paleolimnology, Environmental change, Wetlands

Numerous studies have documented climate-driven decline in freshwater supplied by rivers draining western North America, which has ramifications for ecosystems and society. For the Peace-Athabasca Delta (PAD), Canada, floodwaters from the Peace and Athabasca rivers are critical for sustaining shallow lake basins and abundant wetland habitat, but the frequency of such events has been in decline for decades. Here we take stock of current hydrological conditions in the PAD using isotopic approaches, from both temporal and spatial perspectives. First, we re-visit previously reported multi-centennial isotope-inferred paleohydrological records from five lakes in the PAD, which span a broad spatial and hydrological gradient. Periodic desiccation occurred during the Little Ice Age at the most elevated basin in response to locally dry climatic conditions, yet lower elevation sites were influenced by high water level on Lake Athabasca owing to increased snowmelt- and glacier-derived river discharge. These records are then compared to directly measured lake water isotope compositions from the past 15 years, demonstrating a strong, uniform

influence of evaporation on water balance at the five lakes beginning in the mid-20th century which is unprecedented in the context of the past ~300 years. Second, we characterize hydrological conditions across the delta in 2015, just one year after the most widespread flooding of the past two decades, to show that the floodwaters had largely short-term (within-year) effects. Findings confirm the delta has entered a new climate-driven regime of low water availability, which threatens aquatic habitat and ecological integrity.

Rethinking the Geography of Small Cities: Planetary Urbanization's Inflection Points

Revington, N. (School of Planning, University of Waterloo)

Urban research has been biased towards certain large global cities, a phenomenon known as 'metrocentricity,' which ignores the differences in context and everyday experiences of small cities. Existing research on small cities, meanwhile, has not generally been concerned with generating theory, and specifically theories of urbanization. However, recent interest in the Lefebvre-inspired theory of planetary urbanization holds the potential to bring small cities into view through the eponymous insistence that urbanization is planetary, and not confined to certain reified centres. Yet in practice, planetary urbanization has failed to transcend metrocentricity. The focus of this literature has been instead on the proliferation of large, dense agglomerations (concentrated urbanization) at one extreme, and the extension of the urban into new frontiers through resource extraction and enclosure (extended urbanization) at the other. Small cities therefore represent a conceptual, theoretical, and empirical gap in urban research.

I adopt the mathematical metaphor of an inflection point to argue that small cities can contribute to a more complete theory of planetary urbanization, while planetary urbanization offers a new means of understanding small cities. In doing so, I hope to preserve the most compelling aspects of planetary urbanization without discarding the concept of the city or a focus on the everyday. This also provides a strong justification for the importance of small cities in urban research: the full heterogeneity of urbanization processes is otherwise lost.

Keywords: small cities, planetary urbanization, urban theory, metrocentricity

Mapping and Monitoring Monarch Habitat with Unmanned Aerial Vehicles

Robinson, D.T., and Ridge, J. (Department of Geography and Environmental Management, University of Waterloo)

Monarch butterflies have declined by 90% over the past two decades due to the loss of milkweed. The presented research seeks to determine the growing conditions and unmanned aerial vehicle (UAV) parameters required to effectively map and monitor milkweed. Permanent plots (n=29; 4m²) were established in an abandoned field within which milkweed height, leafspan, and count were measured over 9 field visits spanning July 29th to September 26, 2016. After field measurements were taken, the Aeryon Labs SkyRanger UAV with a visible spectrum payload was flown at multiple heights over each plot. Plots were randomly located using a Leica GS CS15 global navigation satellite system receiver and base station to facilitate image registration with accurate plot locations. Preliminary investigation demonstrated that milkweed leafspan had little correlation to plant height and even without coregistration of field plots and UAV imagery, a Pearson Correlation Coefficient = 0.64 between milkweed field sampling and image identification was attained, and fieldwork is fun! In this presentation new findings will be discussed in our effort to identify 1) the ideal temporal period for UAV mapping milkweed; 2) the ideal sensing platform height, spatial resolution, image overlap, and other remote sensing parameters for milkweed detection; and 3) spatial analysis of milkweed change over the growing season. The presented research seeks to determine the utility of UAV for plant mapping and cost-effective conservation strategies for milkweed, which affects a significant number of Monarchs originating in southern Ontario.

Exploring neoliberal multiculturalism 'from below'

Rose, Erin (York University)

This paper argues there is a need for research that considers how immigrants negotiate, process, and interpret official narratives about Canadian nationhood. How are nation-building narratives present in government discourse invoked and/or challenged by immigrants themselves? Immigrant selection and incorporation are key components of nation-building, particularly in settler societies like Canada. Much existing research documents how Canada's approach to immigration has changed over time, reflecting different nation-building imperatives. The removal of overt racebased selection criteria in Canadian immigration policy in combination with Canada's official commitment to multiculturalism are often considered evidence that Canada is a multicultural nation. Changes in immigration policy and government rhetoric around multiculturalism suggest Canada's multicultural national imaginary is now being reframed according to neoliberal rationales. In other words, these changes suggest Canada has entered into neoliberal era of multicultural nation-building, distinct from the liberal multicultural nation-building of the 1960s. Whereas this scholarship informs our understanding of official or 'elite' conceptualizations of nation-building, in comparison less is known about whether and in what ways these narratives are invoked and/or resisted by individuals. Neglecting nation-building at a micro-level runs the risk of treating the nation as uncontested.

Key words: Nation-building; multiculturalism; immigration; neoliberalism

Enhancing planning and preparedness capacities for climate change resilience in Wawa, Ontario: A community-based photovoice approach

Russo, Samantha. (Department of Geography and Environmental Studies, Wilfrid Laurier University).

The integration of local and Indigenous Knowledge in disaster planning and management has the potential to increase resilience in rural and Aboriginal communities across Ontario. This research incorporates findings from a literature review, and builds on the existing gaps within community-based participatory action research, through a case study of the 2012 Wawa-Michipicoten First Nation flooding event. Ten local community participants from Wawa, Ontario and the Michipicoten First Nations were involved in a photovoice project to visually document their experiences and understandings of the flooding event. This research project seeks to document community perceptions and understandings to the flooding's impact on critical infrastructure, by integrating their perceptions regarding the disaster response, their capacity to deal with the event and any ongoing problems. Draft themes were modified through researcher facilitation, and analyzed for further findings in order to help enhance overall resilience and reduce vulnerabilities in a disaster

situation. Following best practices, feedback was provided to the community after the photovoice project, through a follow-up workshop and photo exhibit.

Keywords: emergency management, photovoice, rural Ontario, critical infrastructure

Opportunities and Constraints for Coastal Adaptation in Metro Vancouver

A. Rutledge¹

¹University of Waterloo, Waterloo, Canada. E-mail: <u>a3rutledge@uwaterloo.ca</u>

Municipalities in British Columbia's Lower Mainland are vulnerable to impacts of climate change. Sea level rise (SLR) and coastal hazards threaten the urbanized and growing population, unique ecosystems, and important local, subnational, and national assets. Awareness of the risks has spurred the need for updated coastal adaptation planning and policy responses. General coastal adaptation responses are known as protect, accommodate, avoid, and retreat. Many municipalities in Metro Vancouver are protected from coastal hazards and flooding from hard structural adaptation methods, with heavy emphasis on coastal engineering infrastructure, such as dikes and seawalls. Alternative approaches, including soft-engineering and non-structural adaptation methods, such as managed retreat, receive less attention. Managed retreat is a coastal adaptation strategy involving the relocation of people and infrastructure away from risky coastal areas. Such an adaptation strategy can offer long-term defence from SLR and coastal hazards. Yet, significant barriers hinder the application of managed retreat. Using a qualitative research method of actorcentred key informant interviews and a review of relevant literature, research explores the opportunities and constraints for coastal adaptation, with a key focus on managed retreat. Initial findings show green infrastructure approaches are gaining momentum, yet managed retreat continues to be a less acceptable adaptation strategy facing numerous barriers. Further, findings reveal that historical flood protection infrastructure and policy constrain alternative adaptation choices, as municipalities were adapted to a set of conditions unrepresentative of the new longterm risks associated with SLR and future climate change. It is therefore worthwhile to pinpoint opportunities to enhance coastal adaptation.

Keywords: Managed retreat, sea level rise, coastal adaptation

Seeking Integrity between Green Infrastructure and Intensification Authors

Sara Saboonian (PhD student, University of Waterloo), Pierre Filion (Professor, University of Waterloo)

Abstract (250 words)

Because of its focus on raising density and multi-functionality, intensification may overlook the need for green infrastructure (GI) and ecosystem services. The Province of Ontario in Canada is

trying to manage urban expansion by intensifying development in sub-centres (Urban Growth Centres, UGCs) while preserving sensitive natural areas. The study concentrates on the distinctions between GI and intensification as well as the form they take to urban dispersion in faster growing North American metropolitan regions.

The study examines two UGCs, which function in the same planning system, but are contrasted by their development stage, protected natural land, and adverse environmental consequences according to the different planning periods. The methods include reviewing the academic and practice literature on GI and intensification, analyzing the Ontario provincial plans and interviewing officials who locally conduct the GI and intensification strategies of the UGCs.

The results indicate the need for a multi-scale GI approach that balances the required space for GI and intensification in UGCs. The GI development in these areas is limited due to inadequate awareness for the GI dimension, increased environmental dis-connectivity by highways and parking, and lack of sharing GI standards and experiments developed by each municipality among UGCs.

Findings suggest a range of possible GI interventions by changing the street patterns and integrating GI and transportation infrastructure to locally enhanced natural systems of existing UGCs. There is a need for the definition and acknowledgment of GI in local environmental policies to achieve an environmentally conscious land-use planning within the context of intensification.

Key Words (Green Infrastructure, Intensification, Planning)

The uncertain health geographies of kidney transplant patients in Guadalajara, Mexico

Carlos E. Sanchez-Pimienta¹, Paulina Madrigal-Vargas², Jeffrey Masuda¹

1. Centre for Environmental Health Equity, School of Kinesiology and Health Studies, Queen's University

2. Departamento de Salud Publica, Universidad de Guadalajara, Mexico

Introduction. Health Geographers have shown that healthcare outcomes are contingent on geographies far beyond the hospital. Inequalities are often exemplified by the variability in healthcare coverage and service quality that people needing a kidney transplant for survival are able to access depending on their socioeconomic position.

Objective. This poster explores the experiences of people on low-income living with a kidney transplant in a developing country as they navigate through everyday geographies surrounding their experiences with the health care system.

Methods. A qualitative study undertaken in Guadalajara, Mexico between 2013 and 2015 involved three group interviews with a total of 34 participants, either living with a kidney transplant or waiting for one. A thematic analysis identified key insights from their experiences.

Findings. Themes included: (1) "Struggling with the health system", which accounted for limited medical information, and lack of trained health personnel to provide care; (2) "Always the money", in regard to the high cost of treatment, and the lack of health insurance; and (3) "Living in uncertainty" depicted a continuous fear of rejecting the transplanted kidney, sudden and abrupt health changes, and an inability to plan about future.

Discussion. The findings describe multiple and geographically layered challenges of living with a kidney transplant and experiencing the health care system. Whereas some of the identified

experiences were already reported in the literature, a number of differences emerged in the context of the fragmented and non-universal Mexican health care system; such as low satisfaction with health care and health personnel, and impoverishment.

Keywords: Illness Experience, Kidney Transplantation, Geographies of Health Care

"AN ANALYSIS OF THE MODE OF THE PRODUCTION OF GENDERED SPACE" Case studies : Madar and Qazvin Squares in Tehran,Iran

Anahid Shirkhodaee

Department of Geography and Environmental Studies, Wilfrid Laurier University

Abstract

Urban spaces, spheres for free unmediated social interactions, are important parts of our everyday social reality. Public space is defined as an open space freely accessible to "the public". Despite the rhetoric of inclusion that public spaces are meant to represent, today some individuals and groups (mainly women) are deprived of these spaces. Women's deprivation and removal from space have led to the formation of gendered space which is tantamount to the erosion of public space and a representation of spatial materialization of social inequalities. This paper attempts to analysis the mode of the production of gendered space and address processes, flows and power relations that contribute to the production of such spaces. To achieve these, the interaction and association between existing gendered representation's (Patriarchal ideologies) and capital relations in the gendered space production are examined. It seems that, by reproducing gendered relations in space and producing gendered space, the hegemony of capital is seeking to reproduce existing unequal production relation. Research problem, therefore, is to examine power relations contribution to the production of gendered space in order to take steps in reducing social inequalities and preventing the reproduction of gendered space.

Key Words:

The production of space, capitalism, patriarchy, gendered space, Iran

PUBLIC ATTENTION TO ENVIRONMENTAL HAZARDS

Amber Silver¹ and Jean Andrey

¹University of Waterloo, 200 University Ave. W., Waterloo, Ontario, N2L 3G1 <u>a2silver@uwaterloo.ca</u>

Over the last century, social scientists across a range of disciplines have made progress in understanding human response to environmental hazards. Yet despite these advances, the social and economic losses incurred from natural disasters continue to rise for a variety of complex geophysical and socio-political reasons. To that end, researchers and practitioners are faced with the same challenge as their predecessors: how to most effectively reduce the social, economic, and physical losses incurred from disasters. Traditionally, social scientists have addressed this question through a variety of different lenses, including risk perception, culture, and education. However, public attention, which is often noted within psychology and communications research for its importance in eliciting behavioural response, has received little attention within environmental hazards' research. This paper critically examines the concept of public attention, and explores its role in behavioural modification during and after potentially hazardous events. The existing literature on attention is synthesized and a comprehensive definition is proposed. Next, a conceptual model is introduced to illuminate how attention to severe and hazardous weather information may translate into behavioural modification.

Keywords: knowledge mobilization; behavioural modification; severe weather; risk

A Critical Analysis of State-Led Recovery of Endangered Species Using the Case Study of Northern and Southern Resident Killer Whales in British Columbia, Canada

Megan Sutton MA Candidate in Geography University of Waterloo

Abstract

The Species at Risk Act (SARA) in Canada endeavors to prevent the disappearance of species, recover species that are extirpated, endangered, and threatened, and to prevent species from becoming endangered or threatened. After species are listed under SARA, a recovery strategy is developed and identifies what must be done to stop the decline of a species. Next, a recovery action plan is written, which specifies recovery measures and assesses socioeconomic impacts. Using the case study of Northern and Southern Resident Killer Whales in British Columbia (for whom an Action Plan was published in 2014), this paper identifies the key types of regulatory mechanisms used to govern private sector activity in marine environments, and finally analyses the viability of regulatory mechanisms for private sector stakeholders in the Action Plan, concluding with recommendations for each involved private sector industry. The Action Plan for the Northern and Southern Resident Killer Whales identifies multiple stakeholders, including three private sector stakeholders: the tourism, agriculture, and fishery industries. Based on this, this essay applied the identified policy mechanisms to each private sector in order to recommend a mechanism for each. Ultimately, this essay recommends economic incentives in the form of taxes for the tourism and fishery sectors, and regulation for the agriculture sector.

Poster Title: The Retail Invasion: New Foreign Chains in Canada <u>Stephen Swales</u>*, Wayne K. Forsythe, Joseph Aversa All: Department of Geography & Environmental Studies, Ryerson University

* Corresponding author: sswales@geography.ryerson.ca

Abstract: A new wave of foreign retailers is arriving in Canada. Many of these retailers are upscale

in their market orientation. The country origins of these newcomers are diverse including the USA, the UK, France, Italy, Spain, Japan, Australia and New Zealand. This poster examines the spatial patterns of these new arrivals and the supply and demand factors underlying the change.

Keywords: foreign retailers, Canada

Sixty years of valuation studies for weather and climate forecast services: A meta-analysis

Million Tadesse (Presenter), Brian Mills - University of Waterloo

Abstract: In recent period, economists and meteorological scientists increasingly interested in applying both demand and production function based economic valuation methods to estimate the dollar value of weather and climate forecast services. Decline in government funding and the tendency of the general public to question whether the benefits of providing these services outweigh the costs often explain the need for economic valuation research in weather and climate forecast services. This paper uses a meta-analysis to evaluate the literature that used demand-side approach to value households' WTP for weather and climate forecast services. Although this approach is commonly used in other areas of studies, it has not been applied to investigate the sensitivity of willingness to pay estimates for weather and climate forecast services conducted by researchers over the last 60 years. Based on a set of screening criteria detailed in this article, 22 studies were selected for the current meta-regression analysis. Results from this study indicate that estimates obtained by various researchers over the last six decades are sensitive to sample size, the type of elicitation and analytical methods, quality of the study (published or unpublished) and the types of interview method employed by individual studies among other factors. After adjusting for inflation and nation's currency differences, a mean WTP value for weather and climate forecast services was derived taking 2015 as the base year. Finally, recommendations were drawn from the study to implicate future economic valuation of weather and climate forecast services.

Title: The experiences and perceptions of flood-prone Canadians: Preliminary results from a national flood risk perception survey

Authors: Dr. Jason Thistlewaithe1, Dr. Daniel Henstra2, Dr. Daniel Scott3, and Dr. Craig Brown4 1 Assistant Professor, School of Environment, Enterprise and Development, University of Waterloo 2 Associate Professor, Political Science, University of Waterloo

3 Professor, Geography and Environmental Management, University of Waterloo

4 Postdoctoral Fellow, Interdisciplinary Centre on Climate Change, University of Waterloo

Keywords: Flood risk management; climate change adaptation; risk perception

Abstract: The results presented in this session are based on a national survey deployed in Spring 2016 which received roughly 2,300 respondents across all 10 Canadian provinces. All respondents lived in areas that had been designated under the Flood Damage Reduction Program, though only 16% (n=383) had experienced a flood. Selected results from this sample will be descriptively explored to highlight the experience Canadians have had with floods, their perceptions of future risks, their degree of concern, and their attitudes towards responsibility. For example, respondents were asked to allocate responsibility for financial losses arising from flood damage, choosing from personal responsibility, various levels of government aid, flood insurance coverage, and NGO support. The results indicate a low degree of personal responsibility for flood damage, and a high expectation for government and insurance coverage support. These expectations are not aligned with the reality many property owners will face after a flood, the implications for which will be discussed. The presentation will conclude with a presentation of results in which respondents were asked to rate their support for various flood risk management policies. For example, respondents

were asked to use a 5-point scale ranging from completely disagree to completely agree to rate the statement "Flood insurance should be mandatory for residential properties in designated flood risk areas." Following a discussion of these results, plans for further will be briefly outlined.

In search of greener pastures: Migration decision-making of Filipino nurses

Maddy Thompson, Newcastle University (visiting scholar at Balsillie School), m.c.thompson@ncl.ac.uk

There is a considerable amount of research which examines the decision-making processes of migrants, yet the overwhelming majority of this research focuses only on those who aspire to migrate. This paper explores the decision-making processes of nurses and nurse students living in Metro Manila, the Philippines. It examines how despite the fact that many young Filipinos enter nursing education as a means to acquire a 'passport' to overseas opportunities, that aspirations of overseas employment for some disappear as domestic opportunities present themselves. While many continue to imagine their futures overseas in 'greener pastures', others turn to novel opportunities within the Philippines as a means to fulfil their desires.

The stories of nurses demonstrate how the Philippines' 'culture of migration' shapes the life choices of many young people, but does not necessarily lead to aspirations of migration. National discourses such as *Bagong Bayani* (national hero) which once pushed the Philippines' youth overseas in search of opportunities which would enable their social mobility on return become less important as nurses deploy their skills to find better opportunities without migrating. I argue the Philippines' 'culture of migration' must be re-examined in light of these new trends. Migration itself appears not to be valued, rather the benefits associated with migration are. Where people are able to accrue such benefits without undergoing the trauma associated with leaving family and friends, migration for many becomes devalued. 'Greener pastures' can instead refer to opportunities beyond (yet often linked with) nursing, rather than opportunities beyond the Philippines.

Key words: Philippines, migration, nurses, cultural geography

A spatial analysis of breast cancer in Southern Ontario

Jenny Tjhin, Isaac Luginaah Department of Geography University of Western Ontario

<u>Abstract:</u>

Breast cancer is the most common form of cancer for women in Canada. In spite of this fact, there is still no identified specific cause for the disease.. Breast cancer clustering by geographic area has been an important public health issue for some time now. Spatial analysis of disease patterns can be used to identify potential environmental factors that may play a role in the etiology and distribution of breast cancer and will help to better understand the variance of breast cancer cases that may be unexplained. This study aims to examine the spatial trend of breast cancer incidents in Southern Ontario overtime. The data for the study comprises a list of breast cancer cases from 1993 to 2013. Using Kulldorff's spatial scan statistic software, SATScan, the analysis reveals persistent clusters of breast cancer. The result will be used for further investigation of potential environmental influences.

Keyword: breast cancer, cluster analysis, spatial scan statistic

Carbon and methane exchange in a restored peatland: evaluating the role of three graminoid species

Touchette, S.1 and Strack, M.1

1University of Waterloo, ON

Close to 30,000 ha of Canadian peatland have been disturbed by extraction for horticulture; this affects their ability to act as a sink for atmospheric carbon. The study site, situated in central Alberta, is a restored peatland colonized mostly by graminoids. Although graminoid species are often grouped as one plant functional type, the greenhouse gas exchange of individual species in restored ecosystems is not well quantified. We focused on three species of graminoids along the hydrologic gradient: Eriophorum vaginatum (E.vag), Calamagrostis canadensis (C.can) and Carex canescens (Cx.can). In order to quantify each species' impact on fluxes of carbon dioxide, measurements were made with an Infrared Gas Analyzer connected to a static clear chamber, while methane flux measurements were conducted with an opaque chamber with concentration determined with a gas chromatograph in the lab. Results of August 2015 indicate that the gross ecosystem photosynthesis and ecosystem respiration were greater for every species under wet conditions. There was greater sequestration as net ecosystem exchange under wet conditions for all species, E.vag having the greatest. Methane emissions were similar under wet or dry conditions for any given species. In conclusion, the three species of graminoids have similar responses under wet conditions, but show distinct responses under dry conditions for carbon exchange. As for methane exchange for every species, the emissions are not related to the hydrologic gradient. Future results will show if these species demonstrate enough disparity to be considered individually in processbased models of carbon and methane exchange in restored peatlands.

Key words: peatland, graminoid, carbon, methane

Weather and Hydrological Data for the CCRN Special Observation and Analysis Period in the Western Canadian Arctic.

M. Tsui, P. Marsh, B. Walker, P. Mann, and E. Wilcox Abstract

The Changing Cold Regions Network (CCRN) Special Observation and Analysis Period (SOAP) is a collaborative initiative to collect, observe, and analyze hydrometeorological data at sites across western and northern Canada. This study will describe a data set collected at the Wilfrid Laurier Integrated Ecosystem Observatory called Trail Valley Creek (TVC). Data was collected during the 2014 to 2015 hydrological year – a period from October 2014 to September 2015. Data collection and analysis across multiple watersheds throughout the CCRN study region has been a key objective of CCRN as it will enable evaluation and inter-comparison of land surface and hydrological models with their outputs. The data set is intended for further processing and quality control, and is accessible to CCRN investigators and collaborators. The aim of this study is to observe and analyze the variations of meteorological data and stream discharge at TVC during SOAP. Analysis of field data includes hourly discharge, air temperature, relative humidity, wind, and precipitation at TVC.

Community Health Workers and Maternal Healthcare in Rwanda: Barriers to the provision of adequate services

Authors:

Germaine Tuyisenge, MA, Department of Geography, Simon Fraser University, Canada Celestin Hategekimana, MD, MA, School of Population and Public Health, University of British Columbia, Canada

Isaac Luginaah, PhD, Department of Geography, University of Western Ontario, Canada David Cechetto, PhD, Schulich School of Medicine and Dentistry, University of Western Ontario, Canada

Stephen Rulisa, MD, PhD, Department of Obstetrics and Gynecology, College of Medicine and Health Sciences, University of Rwanda

Abstract

Reducing barriers to accessing maternal health care is one of the critical components to improving overall maternal health. This study used a qualitative approach to explore the challenges that Community Health Workers (CHWs) face while providing maternal health care in Rwanda. CHWs are the direct contact to mothers in the communities. They provide basic maternal health services such as education and information on the access and utilization of health facilities for maternal health care. Such information include the use of antenatal services, information and services on family planning, behaviour change, delivery in health facilities as well as maternal mental health. The work of CHWs in the area of maternal health combined with other government initiatives were aimed to help Rwanda meet the 5th Millennium Development Goal "Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio". Despite such a tremendous reduction of maternal deaths, Rwanda still ranks among the countries with high rates of maternal mortality. The results of this research highlight the barriers to the provision of adequate maternal health services by CHWs in Rwanda. Reducing geographical barriers and equipping CHWs with more training and resources would help to improve the quality of care provided to mothers.

Key Words: Community Health Workers, Maternal healthcare, Access, Rwanda

Assessing the Spatial and Temporal Trends of Seasonal Ice in a peatland in the Western Boreal Plains; Methods and Preliminary Results

Brandon Van Huizen (Department of Geography and Environmental Management, University of Waterloo)

Dr. Richard M. Petrone (Department of Geography and Environmental Management, University of Waterloo)

The Western Boreal Plains (WBP) experience a sub-humid climate where evapotranspiration (ET) often exceeds precipitation. Evaporative stress in peatlands may cause the water table to decrease, and desiccation of *sphagnum* moss, the dominant species in peatlands. However, this is not the case in the WBP. Seasonal ground ice (SGI) may be an important control on ET in WBP peatlands. As SGI melts, it contributes moisture to the recharge zone and provides a steady supply for ET. This can result in peak ET rates occurring earlier in the growing season instead of coinciding with peak net radiation later in the summer. As the climate warms, it is expected that SGI characteristics and its influence on ET will change. Therefore, it is imperative to understand the timing and spatial extent of SGI at present, in order to understand how they will respond to future climate change. This study assesses the spatial and temporal distribution of seasonal ground ice (SGI) in Western Boreal Plains (WBP) peatlands and the impacts on ET. Data was collected for 2014 and 2015 at a peatland located

in the WBP. Subsurface temperature profiles were installed to characterize freeze/thaw patterns. An ice survey was completed (April-May, 2016) to assess the spatial distribution of SGI. Preliminary results show that the spatial distribution of SGI is heterogeneous during melt, which may contribute to soil moisture variability in the recharge zone. SGI in 2016 melted out in May causing differing SGI spatial patterns to occur during the melt period. Next steps will include snow surveys in order to understand the timing of SGI formation, and using a modelling approach to understand how SGI characteristics will change under different climate change scenarios.

Key Words: Seasonal Ground Ice, Western Boreal Plains, Evapotranspiration, Peatlands

Meeting the Demand for Geoscience Information?:A Jurisdiction Scan of Canadian Provincial Surveys' Geohazards Programs and Projects

<u>Shona L. van Zijll de Jong</u>, *Department of Earth Sciences, Laurentian University, Sudbury, Ontario Email:* shona.vz.dejong@alumni.carleton.ca

This preliminary report, along with our paper *Canadian Hazard Risk Land Use Plans* (presented at the 2016 World Conference on Disaster Management Research) is the first known systematic multidisciplinary study that investigates how the Canadian Federal Government's commitment to the Hyogo Framework for Action 2005-2015 and the Sendai Framework (2015-2030) influences provincial geohazard datasets and products.

This study was aimed at understanding whether Canadian Provincial Geological Surveys have geohazard programs or projects to provide geoscience information for hazard characterization and identification to improve risk assessments. It also sought to determine if these have resulted in improved regulation of land use planning or building community resilience to disaster risk. Methods used to assess if Canadian Provincial Geological Surveys had geohazard programs or projects included: interviews with key informants (face-to-face, telephone and email) and reviewing geohazard project information products available on the Internet.

This paper presents preliminary research results investigating how British Columbia, Alberta, Nova Scotia, Ontario, the Yukon, and the Geological Survey of Canada took a strategic view of geoscience to support land use planning. Yet – the key question remains: whether geohazards programs or projects provide fit-for-purpose geoscience information for hazard identification /characterization to improve risk assessments, and if the production of this geoscience information is causally related to changes in land use planning, changes in community resilience, or public health regulation outcomes.

Key words: provincial geological surveys, geohazard programs, risk assessment, community resilience

Geoscience Research, Canadian Radon RiskScapes and Public Safety Decision Making <u>Shona van Zijll de Jong.</u> Department of Earth Sciences, Laurentian University, Sudbury, Ontario Matthew Leybourne Department of Earth Sciences, Laurentian University, Sudbury, Ontario Email: shona.vz.dejong@alumni.carleton.ca This geoscience radon risk for public health and safety research will provide guidance for future initiatives. Informed by research from information ecology, geospatial information for disaster risk management, and participatory community development, this project has three objectives:

- a) Detail how provincial governments take a strategic view of geoscience to support land use planning and public health and safety initiatives
- b) Provide gap analysis of the legislative context
- c) Document actionable information products created to communicate radon risk
- d) Identify changes in community resilience

This paper presents preliminary results of our research, noting:

- Federal/Provincial/Territorial governments share responsibility for radon
- Geological surveys use five methods to spatially depict the geological occurrence of radon in radon hazard potential maps (these support risk assessment, decision-making, policy, regulation i.e. building code, zoning, etc. and land use planning)
- Geoscience actionable information products further developed by provincial and national agencies (Public Health Ontario, Health Canada and others) help to support communities with geoscience based hazard risk reduction recommendations and mitigation measures.
- Health Canada's radon awareness program supports evidence-based policy and regulatory developments in Ontario. Importantly, the Ontario case study reveals the value of information delivery chains in a population of nearly 14 million seeking to reduce the impact of cancer from radon in Ontario (1,080-1,550 new cancer cases per annum Cancer Care Ontario).

Yet – the key question remains: whether changes in community resilience is causally related to public health initiatives integrating geoscience radon risk research or public health regulation outcomes.

Key words: geological surveys, radon risk, community resilience, information products

Monitoring Rainwater Harvesting Systems in India Using Satellite Remote Sensing Observations

Vanthof, V.R., Kelly, R.E.J. (Department of Geography and Environmental Management, University of Waterloo)

Measurements of volume variations in water reservoirs are important as they can provide relevant information for diagnosing climate change and water resource management. The conservation of water in India has been a challenge even with the infrastructure of thousands of water storage tanks used as rainwater harvesting systems to harvest, store and supply rainwater for domestic and agricultural use. The underuse of these systems and the over extraction of groundwater combined with the uncontrolled spread of an invasive plant species into tank irrigation systems has created significant challenges for water management in India. Remote sensing (RS) observations have a potential to monitor water bodies over large scales and at a minimal cost. The major objectives of this research are to a) monitor water levels in the tanks and b) map the spatial distribution of Prosopis juliflora species through time to quantify its rate of encroachment in the tank systems. The research uses RS satellite observations combined with ground survey geometry of specific tanks in the Gundar River basin in Tamil Nadu to classify the vegetation from its spectral reflectance and quantify the changes in water extent and volume in the tanks. This paper reports on early findings from field work conducted in 2016. The results of this research will evaluate the utility of RS observation-based approaches to water level monitoring and Prosopis juliflora encroachment relative to local in situ estimates and offer a systemic approach to support scientific efforts in water management.

Keywords: Synthetic Aperture Radar; water resources; Landsat time-series; Mesquite (Prosopis juliflora) control

Water risk-perception in Nyanchwa, Kenya

Joann Varickanickal, Elijah Bisung and Susan Elliott; Department of Geography and Environmental Management, University of Waterloo

About 748 million people are unable to access to improved sources of water. Poor water, sanitation and hygiene (WaSH) practices expose many vulnerable populations, especially women and girls, to preventable waterborne diseases such as cholera and hepatitis E. The objective of this project is to explore perceptions around the linkages between the water and health of those living in Nyanchwa, Kenya with a particular focus on women and girls. Women aged 16 and older were recruited for this study using the 'snowball' technique. In-person interviews and photovoice were used. After taking the pictures, each participant was asked to select three photos for a discussion facilitated by the researcher using predetermined questions. I will assist with cleaning and coding the information collected from the photovoice and interviews to determine what linkages women and girls living in Nyanchwa see between the water and health and what they see as potential solutions. As there are several schools in the community, there is the potential for women and girls from a variety of education levels to be included in this study, possibly shedding light on if there is a difference in the perception of water and health among those from various backgrounds of education in this community. If there is little knowledge about water and sanitation and hygiene practices, then further educational initiatives can potentially be implemented.

Keywords: Water, Health, Kenya

PAPER TITLE: VEGETATION COMMUNITY COMPOSITION AS AN INDICATOR OF NATURAL AREA HEALTH IN MISSISSAUGA, ONTARIO

AUTHOR: STEPHANIE VARTY

Abstract: In restoration ecology the concept of a reference site is used to maintain a quantifiable end goal for restoration projects, focusing on ecosystem health and sustainability. In urban restoration projects the use of reference sites often creates unrealistic goals as biotic and abiotic characteristics of a system have been permanently altered due to stressors associated with urbanization and fragmentation of landscapes. Biological indicator taxa can be used to create a multi-variate framework which projects characteristics of an indicator taxa to represent the health of each site in relation to one another. This approach is applied to urban terrestrial ecosystems to answer the questions: 1) Is vegetation community composition an accurate biological indicator of natural area health in Mississauga, Ontario? 2) How can multi-variate statistical analysis be used to make effective decisions in urban terrestrial restoration plans? The relationship between vegetation community structure, ecosystem stressors and spatial structure were assessed using linear regression models and principal components analysis. Results highlight that the interpretation of vegetation community structure as a framework for creating a statistically accurate reference framework is limited due to the ecologically complex nature of the communities' interactions. The role of species competition and invasive species in community regulation demonstrate that the general scale at which community and stressor data is collected at in urban management plans may not result in accurate indication of ecosystem health. **Keywords:** Restoration; Terrestrial; Urban

#happy: land use and happiness Eric Vaz, PhD Department of Geography and Environmental Studies Ryerson University, Toronto, ON, Canada

Abstract

The advances in smartphones have allowed a ubiquitous creation of media content, which is available at a global scale and to almost every single individual on Earth. In the case of Instagram, this digital content are images often with a charge of emotional content, allowing by means of textual analysis of specific hashtags to better understand subjective emotional states of users. I explore the use of Instagram, a leading photo sharing application, to analyze the sentiment analysis of Georeferenced data aligned to perception of happiness. This is achieved by images with a given hashtag related to textual interpretation of the state of subjective well-being. These hashtags are then geocoded, allowing conducting a spatially-explicit exploratory assessment. (i) A first spatial construct is presented looking at the spatial autocorrelation patterns at global and local level for the region of the Golden Horseshoe as to allow the convergence of spatial clusters both for predominant hotspots and coldspots. (ii) Following this, a land use analysis is carried forth as to understand the morphology of land use in the region. (iii) Finally, I construct a land use accounting proxy by means of correlation coefficients using Kendall tau-b correlation. The research is framed within the importance of adding large data sets of social networks the social sciences with geographical analysis offering a new definition for regional science. The paper concludes that there are significant differences between the profiles of hotspots of subjective wellbeing and happiness as a resulting causation of urban land use.

Keywords: subjective wellbeing; spatial analysis; happiness landscapes

Applying a novel theoretical framework to recreation and tourism research: The case for Protection Motivation Theory

Stephanie Verkoeyen, University of Waterloo

This presentation will explore how a novel theoretical framework can be applied to a field of research, using Protection Motivation Theory within the field of recreation and tourism as a case study. It will detail how the theory was initially selected by examining both the tourism and climate change adaptation literature and broader climate change adaptation literature. The appropriateness of this theory is explained through comparisons to two commonly applied theories

in recreation and tourism. It will then describe how application of this framework can expand our knowledge of existing constructs, focusing specifically on activity involvement and place attachment. Finally, a geographic lens is adopted to discuss how responses might differ depending on the location of the sample population.

KEYWORDS: tourism and recreation; climate change adaptation; theoretical framework; research process

Title: School nutrition policy compliance in Ontario and Alberta: An environmental assessment of secondary school vending machine data from the COMPASS Study

Authors: Vine, M.M.¹, Harrington, D.W.¹, Butler, A.¹, Patte, K.¹, Godin, K.¹, Leatherdale, S.T.¹ Author Affiliations: ¹ School of Public Health and Health Systems, University of Waterloo Abstract (254 words)

Objectives: To assess the extent to which the food and beverages for sale in vending machines in Ontario and Alberta secondary schools are in compliance with provincial school nutrition policies. **Methods**: Objective drink and snack data from vending machines were examined among Ontario and Alberta secondary schools, collected through the COMPASS study over three years (2012/13, 2013/14, 2014/15). Drink (e.g., sugar-containing carbonated/non-carbonated drinks, etc.) and snack (e.g., chips, crackers, etc.) data were coded by price, location of machine(s) in schools, and number of units. Descriptive analyses were undertaken using R version 3.2.3. In order to assess policy compliance, nutrition information of the available products were compared to nutrition standards set out in the Alberta Nutrition Guidelines for Children and Youth (2012) in Alberta, and P/PM 150 (2011) in Ontario.

Results: Results indicate a decrease over time in the number of schools selling crackers (26% vs. 17%), cake products (12% vs. 5%) and sugar-containing carbonated drinks (9% vs. 3%) in vending machines, with uneven changes in the number of schools selling chips (53%, 67%, 65%). On the other hand, results reveal increases in the proportion of vending machines selling cookies (21%, vs. 40%) and chocolate bars (7% vs. 13%) between 2012/13 and 2014/5.

Conclusion: The nutrition environment is complex, and vending machines are one component of a broader food landscape in schools. School vending machine contents reflect limited compliance with nutrition policy guidelines. Policy compliance can be improved upon through a provincial-level school nutrition policy monitoring and evaluation strategy, including on-going information sharing and support.

Keywords: school nutrition, built environment, policy implementation, school health

Application of fixed-wing Unmanned Aerial Systems for high-resolution documentation of snowmelt water budget across shrub-tundra landscapes Branden Walker¹, Philip Marsh¹, Philip Mann¹, Tyler deJong¹ Wilfrid Laurier University Correspondence: <u>bwalker@wlu.ca</u>

Keywords: Hydrology, Snow, Remote Sensing, Unmanned Aerial Systems

The hydrological cycle of Arctic-tundra is greatly impacted by the deposition and redistribution of snow during the winter months. The end-of-winter snowcover is characterised by significant smallscale (of the order of a few metres) spatial variations in snowcover depth, density, and thus snowwater equivalent (SWE). The end-of-winter SWE distribution across these landscapes is shown to have significant hydrological influences during the spring snowmelt period, resulting in a spatially heterogeneous snowmelt and with significant controls on the timing and magnitude of snowmelt runoff. Traditional remote sensing techniques for quantifying snowcover depth and snowcovered area during melt are characterised by coarse spatio-temporal resolutions and therefore fail to capture small-scale snowcover conditions across small distances and over the duration of the snowmelt period. This study aims to capture small-scale spatial variations in end-of-winter snow depth and document the spring snowmelt changes in snow depth, snowcovered area and basin water storage at unprecedented high-resolutions though the application of a fixed wing Unmanned Aerial Systems (UAS). Our multi-year study reveals a strong correlation between observed and measured snow depth at a catchment scale and demonstrates a successful application of UAS for measuring snow depth. The addition of in-situ hydrological data allows for high spatio-temporal quantification of end-of-winter SWE and snowmelt across our study basin, allowing for a detailed documentation of the complex and dynamic spring snowmelt runoff processes in these tundra ecosystems.

Rainwater harvesting as adaptation to climate change: an interdisciplinary question

Johanna Wandel, University of Waterloo

Southern India has undergone a broad-scale shift in water management since the late 19th Century. Traditionally, both rural and urban areas relied on monsoon harvesting, the surface storage of high seasonal rainfall in small to medium-scale reservoirs. The groundwater boom of the 20th Century resulted in the widespread adoption of deep drilled wells and associated groundwater pumping. Groundwater recharge has not, however, kept pace with pumping, resulting in increasingly deeper wells. The current state of groundwater over-exploitation, the lack of access to groundwater for agricultural purposes among non-well owners and the potential of a weakening Asian monsoon have led to calls for the revitalization of traditional surface water storage in rural areas as a solution for supply, equity and climate change adaptation problems. Small-scale rainwater harvesting structures are now frequently seen as the most cost-effective, efficient, and environmentally neutral means of meeting demand in monsoon-controlled water-stressed regions and contributing to meeting the Millenium Development Goals as well as adaptation to climate change. Evaluating the potential of small-scale rainwater harvesting for adaptation to climate change and equity requires an interdisciplinary geographical perspective, from livelihoods research to hydrology, with additional expertise in agent-based modelling, commons governance and even remote sensing. This paper illustrates this argument with a case from southern Tamil Nadu, India. Keywords: rainwater harvesting, adaptation, common property governance

Evaluating the effects of road network structure on traffic congestion and retail store sales

Junyi Wang and Derek T. Robinson (Geography and Environmental Management, University of Waterloo)

Keywords: network analysis, traffic congestion, accessibility, retail sales estimation. The physical road system plays a critical role in environmental and city planning. In the context of retail store allocation, measures of accessibility and the ease and willingness of consumers to commute to and from the store can be essential to revenue generation and success. To quantify accessibility requires a detailed examination of road network and in many cases modeling to estimate potential traffic congestion. The application of network theory to assess the accessibility of road segments and land parcels is non-existent. Research on the effects of the structure of the road network, via network analysis, can facilitate identifying potential congestion issues and subsequently the effects of congestion on commercial performance (e.g., retail sales). The application of network analysis to a road network is distinctive from applications in other disciplines (e.g., sociology, ecology), since, among other network attributes, the road network is a low-dimension network where the maximum degree rarely exceeds six. In addition to conceptually interrogating the difference between social and road networks for network analysis, the presented research describes preliminary results that show the relationship of different network metrics with simulated traffic congestion. The presentation will conclude by discussing how these results will be used to statistically evaluate the strength of the relationship between network attributes and retail sales relative to socio-demographic and site-location characteristics.

Paper Title:

The Uneven Impact of Water Security Issues for Inuit in Iqaluit

Author: Victoria Watson, MA Student York University Toronto, Ontario, CA <u>vwatson@yorku.ca</u> (647) 680-9446

Key Words: Arctic, Water, Gender, Emotional Ecologies

In the Arctic, Inuit communities often face specific and serious challenges accessing adequate and safe municipal water. In Iqaluit specifically, the community experiences frequent water shutdowns and shortage due to aging infrastructure and inconsistent daily water delivery for those who are still on trucked water. This paper will discuss the preliminary results of fieldwork undertaken in 2016. Using principles from Indigenous methodologies in concert with an intersectional feminist framework, data was collected through a series of 21 semi-structured interviews with Inuit community members and various opportunities for experiential learning. Grounded in place and with an emphasis on the everydayness of water shortage, the results show how water security is an emotional, embodied experience that may be very stressful, but affects different groups differently. Specific results will be discussed with respect to age and gender. This paper concludes with strategies and adaptations that community members often use to access water during times of water shortage.

Traditional Ecological Knowledge of Beluga Whale (Delphinapterus leucas) in a changing climate in the Inuvialuit Settlement Region (ISR), NWT.

Authors

Devin Waugh¹; Peace, Tristan^{1,2}, Ostertag, Sonja³, Bradshaw, Ben¹

¹Department of Geography, University of Guelph, Guelph, ON ²Sustainability Research Centre, University of the Sunshine Coast, Australia ³Fisheries and Oceans Canada, Winnipeg, MB

Keywords

Arctic, traditional ecological knowledge, climate change, beluga

Abstract:

The Beluga Whale (Delphinapterus leucas) is an important species to the coastal Inuvialuit communities of the Western NWT. Despite the ongoing local cultural and nutritional importance of beluga whale, and ongoing scientific monitoring in the region, little research has examined local and traditional understandings of beluga. The dearth of knowledge is made more poignant by the rapid climatic and non-climatic changes that are occurring in the region. As key stakeholders in the outcomes of beluga management, Inuvialuit have indicated their desire to document their TEK of beluga. The ongoing research documented TEK about the ecology and behaviour of the beluga whale, hunting techniques, and subsistence preparation under changing climatic and non-climatic conditions through a case study in the Inuvialuit Settlement Region from June to August 2016. Ethnographic research methods were utilized for data gathering activities, including semi-directed interviews and participant observation. Three objectives will be addressed through the research, including: (1) characterizing the local Inuvialuit relationship with beluga, including ecological knowledge of the species, hunting techniques, and subsistence preparation (2) documenting change and stressors affecting Inuvialuit/beluga relationships, and (3) identifying challenges and opportunities for inclusion of TEK in beluga co-management regimes.

This research is part of ArcticNet Project 1.8 "Knowledge Co-Production for the Identification and Selection of Ecological, Social, and Economic Indicators for the Beaufort Sea".

Climate-induced environmental change and the future of tourism at the Athabasca Glacier

Weber, M. (Department of Geography and Environmental Management, University of Waterloo), Lemieux, C.J. (Department of Geography and Environmental Studies, Wilfrid Laurier University), Groulx, M. (School of Environmental Planning, University of Northern British Columbia) and Scott, D. (Department of Geography and Environmental Management, University of Waterloo).

An important element of the tourism industry in North America is nature-based tourism, which mostly occurs in parks and protected areas. These major tourism resources are projected to undergo large scale changes as a result of climate change and the implications for visitation, tourist satisfaction and park management remains largely unexplored. The aim of this research is to determine how much change the Athabasca Glacier can sustain within each of the three components that make up the concept of carrying capacity: environmental resources, the type and

quality of the recreation experience, and the extent and direction of management action. Using the limits of acceptable change framework and scenario planning, tourism development scenarios for 2050 were developed using a matrix approach with values corresponding to commitment to ecological integrity and level of consumer demand. Visualizations of the four scenarios were presented to tourists at the Athabasca Glacier through a tablet-based survey that focused on visitor motivations, expectations and satisfaction with current and future conditions. Tourist perceptions and responses to environmental change are not well understood and there is very little understanding of how adaptation pathways pursued by parks may change the way potential visitors perceive destinations and result in changes in visitor patterns. The results of this study can be used to better inform policy and management decisions at the park level and help identify what needs to be done to protect Canada's significant nature-based tourism industry in Western Canada.

Keywords: Climate Change, Environmental Change, Carrying Capacity, Tourism

Title: The hydrological importance of a spatiotemporally variable frost table in the western Canadian Arctic

Evan Wilcox, Dawn Keim, Phil Marsh, Andrew Ireson, Branden Walker, Philip Mann In areas of continuous permafrost, the frost table marks the impermeable boundary within the soil. This area is also covered by mineral silt-clay hummocks, formed through cryoturbative processes. In the inter-hummock zone lies highly porous and hydraulically conductive peat. These features affect subsurface flow, soil water storage capacity, and streamflow response. During 2015 frost table depth was measured at a high spatiotemporal scale within the Siksik Creek sub-basin of Trail Valley Creek (68.75°N, 133.5°W). Weekly measurements of hummock and accompanying inter-hummock zones were combined with soil samples from each site which were evaluated for soil moisture, dry bulk density and organic content. The data produced showed

were evaluated for soil moisture, dry bulk density and organic content. The data produced showed a rapid transition in the topography of the frost table between hummock and inter-hummock zones mid way through the summer. The data was also used to investigate a suggestion by Endrizzi et al. (2011) that the main control on active layer depth in the inter-hummock zone is soil moisture. Documenting how the frost table changes at spatial and temporal scales is therefore important to understanding how the affected processes behave, and allows better modelling capability to examine the future impacts of climate change.

Endrizzi, S., Quinton, W. L., & Marsh, P. (2011). Modelling the spatial pattern of ground thaw in a small basin in the arctic tundra. *The Cryosphere Discussions*, 5(1), 367–

400. http://doi.org/10.5194/tcd-5-367-2011

Key Words: active layer, permafrost, soil moisture, hydrology

Global Health from the Margins: Thoughts from Students Engaging in Cross-Sectoral Collaborations

Lacey Willmott, Geography, University of Waterloo; Devin Waugh, Geography, University of Guelph; Lesley Johnston, Public Health and Health Systems, University of Waterloo,

Global health has undergone a number of transitions as it evolved from its bio-medical, clinically focused origins to its current focus of achieving wellbeing and equity for all. Yet as we face the challenges that confront our planetary and population health another transition in global health seems imperative. From economic growth to population growth, and from environmental degradation to climate change, these wicked, even super wicked, problems demand not only broadly conceived research agendas and multi-scalar interventions, but offer an opportunity to re-

image the ways in which we engage with global health challenges. As young social scientists working from what are currently the margins of traditional global health research we are inspired by the opportunities offered by new global commitments such as the UN's Sustainable Development Goals, transdisciplinarity, and complex systems research. The challenges of working in this way are great, yet given the scope of the problems we face perhaps it is vital. We propose to explore the potential of what it means to study health from the margins, within the context of the Sustainable Development Goals. We will use this opportunity to grapple with prospective challenges, and to contemplate a research and action agenda that we as young global health researchers believe must be pursed, while calling on our audience for their thoughts on our early deliberations.

Key words: Global health, health transitions, sustainable development goals

<u>Studying the Impacts of a Changing Snowpack on the Bathurst Caribou Herd, Northwest</u> <u>Territories</u>

Nick Wilson¹, Michael English², Colin Robertson³, Jan Adamczewski⁴ and Roy Judas⁵ 1 Geography and Environmental Studies, Wilfrid Laurier University, wils0828@mylaurier.ca 2 Geography and Environmental Studies, Wilfrid Laurier University, <u>menglish@wlu.ca</u> 3 Geography and Environmental Studies, Wilfrid Laurier University, <u>crobertson@wlu.ca</u> 4 Wildlife Division, Environment and Natural Resources, GNWT 5 Environment and Natural Resources, GNWT

<u>Abstract</u>

The Bathurst Caribou Herd have experienced a $\sim 90\%$ population decline since 1996. Many northern barren ground caribou herd have experienced a similar decline. Natural population cycles do occur with this species, yet the population numbers for the Bathurst herd are the lowest on record. It is hypothesized that the cause of this decline is linked to food availability during the winter months and increasing predation rates caused by a changing snowpack. It is then important to investigate the patterns in the amount of seasonal snow water equivalent. It is also believed that the amount of snow on the ground will affect caribou herd distribution. Using remotely sensed snow data and collared caribou data, this research aims to investigate correlations between these two variables and to determine similarities of annual homeranges. Temporal resolution for this study is from the years of 1996-2013. Data for both snow and caribou has been analyzed for this time period. The collared caribou data has been used to examine SWE experienced by individual caribou and to construct annual homeranges. Furthering the understanding of the relationship between snow and caribou is important for future wildlife management efforts. Understanding the snowpack change and how different variable can affect caribou is crucial for the species population recover and management. This analysis provides results to a complex relationship between the winter environment, change in snowpack characteristics and the Bathurst Caribou Herd as well as the evolutionary trends of the herd's annual homeranges.

Keywords: Caribou, Snow water equivalent, Northwest Territories

Title: Ebullition from Marsh Sediments after Wetland Restoration Authors:

Victoria Wisniewski¹, MSc Geography Candidate, University of Toronto Mississauga, Mississauga, ON L5L 1C6

Monika Havelka, Senior Lecturer, University of Toronto Mississauga, Mississauga, ON L5L 1C6 Tim Duval, Assistant Professor, University of Toronto Mississauga, Mississauga, ON L5L 1C6 **Abstract**:

Rattray Marsh Conservation Area, Mississauga, is a rare ecological gem in Southern Ontario. It is the only freshwater coastal bay-mouth bar of its kind between Hamilton and Oshawa. During the winters of 2013 through 2015, the Credit Valley Conservation Authority (CVC) restored two sections within the marsh's bay. Mineral silt sediment which had accumulated over the course of decades was removed through the method of dredging. The purpose of the restoration was to expose the underlying organic sediment layer, enhance the livelihood of native species, and manage invasive flora and fauna species populations. The purpose of this study is to test whether the mineral silt layer functioned as a buffer to hinder anaerobic greenhouse gases (GHGs) from being released into the atmosphere. The study aims to quantify the ebullition volume fluxes and methane (CH4) mass fluxes through in situ measurements and sampling of ebullition events. Ebullition gas bubbles were captured using floating inverted funnel bubble traps. Gases were analysed using Gas chromatography (GC) for CH4 concentration determination. Results indicate that proportionately, restored sites exhibited higher CH4 concentrations, by volume, than the unrestored reference site. Significant differences were exhibited across all study sites in terms of ebullition volume releases, CH4 mass fluxes, water height, and sediment composition characteristics. Finally, overall increases of mean ebullition volumes and mean CH4 mass fluxes were exhibited over time, suggesting population growth of methanogenic microbial communities in response to a soil temperature lag. Keywords: Ebullition, wetlands, restoration, Greenhouse gases (GHGs).

¹ indicates presenting author.

Title: Using rLakeAnalyzer and Constant Monitoring Buoys to Track Cyanobacteria Bloom Development in Callander Bay and Wasi Lake, Ontario

Author: Kyle Wittmaier (Nipissing University Research Assistant) Abstract: Attached in pdf format Keywords: Cyanobacteria, Limnology, rLakeAnalyzer

The reported occurrences of cyanobacteria blooms in Canadian Shield lakes are on rise. Understanding the complex mechanisms that contribute to these blooms helps to identify appropriate management responses. Callander Bay and Wasi Lake are shallow, eutrophic, polymictic systems in central Ontario that occasionally experience cyanobacteria blooms. This study uses meteorological and limnological parameters, and water chemistry and phytoplankton data to understand the mechanisms contributing to cyanobacteria blooms in these two systems. Meteorological data were gathered at the Callander Bay buoy and weather stations throughout the region. The Lake Analyzer software developed by the Global Lake Ecological Observatory Network is use to analyze the meteorological controls on mixing and stability of the water column. Limnological data are collected using buoys equipped with temperature sensors spaced vertically at 1m increments and dissolved oxygen probe 0.5m above the bed to monitoring mixing events and hypoxia. These data will be combined with bi-weekly water samples (dissolved P and Fe, sulfate, nitrate, ammonium, and phytoplankton) collected during the 2016 summer-fall season to understand the significance of internal P loading. Both systems show evidence of stratification and hypoxia throughout the 2016 season, which indicates the potential for internal P loading contributing to the eutrophic status of these lakes. This will be confirmed when water chemistry and phytoplankton sample results become available.

Build Back Better Disaster Recovery in Java, Indonesia: Keys to Success in Village Reconstruction and Relocation

Woodhall, B. (Department of Geography and Environmental Management, University of Waterloo)

The reconstruction of Puton village in Yogyakarta after the 2006 Yogyakarta earthquake, and the relocation of Pucang Mojo and Mepitan villages in Surakarta following the Solo River flood of 2007 were largely considered successful disaster recovery projects by residents affected by disaster and outside observers. Describing and explaining this success within a specific geographical and cultural context -- Java, Indonesia -- is instrumental in guiding good, relevant recovery practices. Through a critical analysis of informal interviews with key resources in Indonesia, supplemented by observation and secondary data, key factors behind the success of these recovery projects identified by locals and local actors were found to be parallel to some of the key Build Back Better propositions. In particular, three main factors were identified to be particularly important in these Indonesian cases of disaster recovery: Communities led their own recovery with support from government and non-governmental organizations, hazard risk was reduced for the villages by (re)building safer and stronger, and local governments and actors were key stakeholders through the recovery of the villages.

Keywords: Indonesia, Build Back Better, disaster recovery, disaster risk reduction

The privilege of a parental safety net: Millennials and the intergenerational transfer of wealth and resources

Nancy Worth, Department of Geography & Environmental Management University of Waterloo 200 University Ave W, Waterloo, ON N2L 3G1

This paper examines the intergenerational transfer of wealth and resources as a mechanism for coping with insecure work. As Millennials finish education and enter the world of work, many experience labour market precarity in the form of underemployment and unemployment, or find jobs with little security or potential for upward mobility. In order to manage this insecurity, millennials often turn to their parents for various forms of support, including money for school or day to day bills, job connections, housing, as well as care and emotional support. This intergenerational transfer of resources is a form of privilege—not all parents can financially support their children through their twenties, have the space for their adult children to live at home, or have the social capital to get their children meaningful work. As a result an *intra*generational divide emerges as some Millennials have a parental safety net that helps them cope with insecure work while others struggle to make it on their own. Using indicative examples from research with Millennial women and their mothers, this paper takes a detailed look at how forms of intergenerational transfer impact young people's possibilities and choices in the labour market.

Keywords: generation; inequality; housing; labour

Characterizing the Spatial Extent of a Basal Channel Under Antarctica's Nansen Ice Shelf Using Low Frequency Ground Penetrating Radar.

Peter Wray

Keywords: Antarctic ice shelf, ground penetrating radar, basal channel, anisotropy

In November 2016 a low frequency Ground Penetrating Radar (GPR) survey will be completed on the Nansen Ice Shelf in Antarctica, overtop of a basal channel, under approximately 200m of glacial ice. Two to three separate GPR transects will be run over the basal channel ranging from within 500m from the ice shelf edge to the hydrostatic grounding line. This investigation is designed to characterize the shape and location of the basal channel and to spatially delineate the open water section from the marine ice component of the channel. The data will be processed using ReflexW and supplied to colleagues at University of California, Davis in order to deploy a tethered Underwater Autonomous Vehicle (UAV) into the basal channel in early 2017. The site can experience average wind speeds of 15m/s (Bromwich et al, 1984) that prevent the accumulation of surface snow and firn, which greatly increase the GPR signal attenuation. Other work with GPR on continental ice sheets have demonstrated that the crystal orientation fabrics of polar ice sheets produce dielectric anisotropy that certain frequency ranges interact with differently depending on the orientation of theses electromagnetic wavelets relative to the orientation of the c-axis of the ice (Fujita et al, 2000). As such, an opportunity to examine the dielectric anisotropy of glacial ice, an often neglected source of error, is also presented at this site due to the good ground contact present.

Title: Financial Constraints of China's Small and Medium Enterprises

Authors:

Ruilin Yang (corresponding author)
Department of Geography and Planning, University of Toronto
100 St. George Street, Toronto, ON M5S 3G3, Canada.
Email <u>ruilin.yang@mail.utoronto.ca</u>

• Albert Berry Department of Economics, University of Toronto 1 Devonshire Place, Toronto, ON M5S 3K7, Canada. Email <u>berry2@chass.utoronto.ca</u>

Abstract (178 out of 250):

While small and medium enterprises (SMEs) played an important role in China's economic development process, they have always been suffering from financial constraints. Using an enterprise survey, combined with personal interviews in the Hengli Town of Dongguan city, this paper investigates the factors that affect credit accessibility of Chinese small and medium enterprises. The main findings are that access to finance improved as firm size increased and that companies in better off regions have a better chance to receive bank loans. Looking at bank ownership structure, state-owned banks accounted for the majority of bank loans issued, which indicates that decisions on credit accessibility are still largely influenced by state policies. Finally, through interviewing owners and banking officials in the Hengli town, it is found that financial accessibility of SMEs in China also influenced by local connections and the formality and efficiency

of the financial system. Overall, the findings suggest that access to credit of SMEs in China is closely related to firm size, the region that companies locate in and the formality and development of the financial system.

Keywords: Small and Medium Enterprises, Financial Constraints, China

Identification of Building Surface Materials Using Hyperspectral Remote Sensing Imagery

Chengming Ye, Visiting Scholar, <u>rsgis@rsgis.sina.com</u> Saied Pirasteh*, PhD student, <u>s2pirast@uwaterloo.ca</u> Jonathan Li, Professor, <u>junli@uwaterloo.ca</u> WatMos Group, Department of Geography and Environmental Management Faculty of Environment, University of Waterloo 200 University Avenue West, Waterloo, Ontario N2L 3G1

ABSTRACT

The management of hazardous building materials poses legal and financial challenges for those in the construction, real estate and property management fields. Building surface materials have different spectral responses in the electromagnetic energy spectrum. Remote Sensors can receive the energy reflection and transmission from the building surface materials. This study investigates the spectral characteristics of building materials in the wavelength ranging from 350 nm to 2500 nm, such as colour steel, clay, glazed tile and asphalt concrete and so on. Also, it discusses extracting information methods of the construction materials from the hyperspectral remote sensing images. This study accomplishes a unique practical applied model of spectrum measurements and analyses of common building materials by using hyperspectral remote sensing data EO-1 Hyperion over an urban area. Our results show that building surface materials can be identified by the hyperspectral remote sensing imagery with a reasonable quality as the spectral sensitivity to building materials is different. For example, concrete and asphalt are more sensitive than other materials. Our study concluded that methods based on hyperspectral remote sensing imagery and spectral recognition technique are an efficient way to extract the information of building materials.

Keywords: building material, hyperspectral remote sensing, spectral recognition, spectrum analysis

<u>Common attributes in trees: a case study of the private urban forest in the Greater Toronto</u>

<u>Area</u>

Vivian Yip (presenting author) and Tenley Conway

University of Toronto

Recent research has emphasized that healthy urban forests should be comprised of a wide diversity of species in order to increase ecological integrity and reduce vulnerability to diseases, extreme weather events, and other stressors. In addition to maintaining diversity, ecological integrity is supported through the preservation of native tree species, which are considered necessary to maintain ecological integrity. However, urban forests are often composed of novel species assemblages, including exotic species, as they are shaped by their physical characteristics and human influence. Recent studies found that urban landowners are selecting landscaping species, including trees, based on a set of aesthetic (i.e. flowers and colour) and functional (i.e. shade

provision and fruit provision) attributes, without considering species diversity or ecological integrity. As the majority of urban trees are located on private property, landowners' preferences expressed through tree planting and maintenance has a significant impact on the urban forest. This study explores the relationship between species diversity and aesthetic and functional attribute diversity, as well as property-level species richness in relation to household characteristics, to better understand how landowner choices may impact the urban forest. Field inventories of trees on residential properties were conducted in Markham and Oakville, Ontario. Household characteristics were gathered through a written survey focused on knowledge and attributes towards urban trees. Findings related to property-level species richness and aesthetic and functional attribute will be provided. The presentation will end with a discussion of private landowners' influence on the urban forest.

Keywords: urban forest, tree attributes, residential landscape, species diversity

Title: Food by Ward: Food Assets and Opportunities in Toronto Presenter: Laine Young Key words: Food Security, Asset Mapping, Toronto, Community

Abstract

Across Toronto, communities are working tirelessly to solve food access problems and promote equity within the city. However, in many areas, Torontonians are still food insecure. Food by ward is an initiative through Toronto Public Health's Food Strategy and the Toronto Food Policy Council. This project documents community food assets within the city. These assets include, mobile food markets, healthier food retail, community food agencies, food box programs, emergency food programs, community kitchens, farmers' markets, student nutrition programs, school and community gardens, food co-ops and food festivals. Promoting food assets within the city will work to nourish communities, grow an edible city, celebrate food festivals and events and create good food jobs. The assets are mapped by the 44 electoral wards. Food by Ward is a method of engagement with City Council to work towards strengthening connections to move food priorities forward, integrating food into broader City planning, and advocating equitable distribution of food assets across the City. This project used multiple data sources including community consultation with organizations and individuals who are working within these food assets daily, and existing open source City of Toronto data. In outlining each ward's food assets, we were also able to determine the food opportunities in the various areas of Toronto. This initiative provided a connection between the City Councilors and their community members to work towards a common goal of promoting food assets for all Torontonians.

Title: Quality Evaluation of Volunteered Geographic Information: The Case of OpenStreetMap

Author: Hongyu Zhang (Department of Geography, Western University) Registration ID: 96176882

Abstract: A large amount of crowd-sourced geospatial data have been created in recent years due to the interactivity of Web 2.0 and the availability of Global Positioning System (GPS). This geo-

information is typically referred to as volunteered geographic information (VGI). OpenStreetMap (OSM) is a popular VGI platform that allows users to create or edit maps using GPS-enabled devices or aerial imageries. The issue of quality of geo-information generated by OSM has become a trending research topic because of the large size of the dataset and the inapplicability of Linus' Law in a geospatial context. This paper systematically reviews the quality evaluation process of OSM, and demonstrates a case study of London, Canada for the assessment of completeness, positional accuracy and attribute accuracy. The findings of the quality evaluation can potentially serve as a guide of cartographic product selection and provide a better understanding of the development of OSM quality over geographic space and time.

Keywords: data quality, Volunteered Geographic Information, OpenStreetMap

Hongyu Zhang

MSc Candidate | Department of Geography Faculty of Social Science | Western University

Determination of Forest Inventory Parameters Using a Terrestrial Laser Scanner

Simon H. Zhao, MSc Student, Jonathan Li*, Professor, Linfei Ma, MSc Student WatMos Group, Department of Geography and Environmental Management Faculty of Environment, University of Waterloo 200 University Avenue West, Waterloo, Ontario N2L 3G1 {h224zhao, junli, l53ma}@uwaterloo.ca

ABSTRACT

Conventional forest inventory methods such as field surveys and aerial photointerpretation are time-consuming and labour intensive. This poster presents a novel method for capturing the forest inventory parameters, including diameter at breast height, height and diameters along stem profiles, using a terrestrial laser scanner. The dense point cloud data collected by the scanner were processed by the algorithms and software tools developed at our WatMos Lab in the University of Waterloo through a collaborative research program at Xiamen University, China. Our method consists of three steps: (1) detection and extraction of individual trees in point clouds based on the statistical calculation of the local maximum height value of individual trees, (2) calculation of the tree height along the stem profile, which ranges from the peak point to the bottom point of each tree, and (3) determination of the diameter at breast height using a cylinder fitting algorithm. A total of four point cloud datasets containing over 82.65 million points with a data size of 2.61 GB, covering different forest scenes in a fairly rough terrain were collected by a Trimble TX 8 laser scanner in north Fujian, China and used in this study. Besides, a total of 427 individual trees were manually measured as ground truthing data. Our experimental results demonstrated the effectiveness and reliability of our method, as indicated by the precision of 0.82, the recall of 0.99, and the F1-score of 89.80% that were obtained using the four datasets.

Key words: forest inventory, geometric parameter, terrestrial laser scanner, point cloud

Challenges in evaluation of safety effect of roundabouts

Yue Zhao*

Department of Geography and Environmental Management, University of Waterloo, 200 University Ave West, Waterloo, N2L 3G1, Canada. *Corresponding author E-mail: v349zhao@uwaterloo.ca

*Corresponding author E-mail: y349zhao@uwaterloo.ca

Jean Andrey

Department of Geography and Environmental Management, University of Waterloo, 200 University Ave West, Waterloo, N2L 3G1, Canada. jandrey@uwaterloo.ca

Peter Deadman

Department of Geography and Environmental Management, University of Waterloo, 200 University Ave West, Waterloo, N2L 3G1, Canada. pjdeadma@uwaterloo.ca

Roundabouts, as a new form of intersection traffic control, are being touted as significantly improving safety and efficiency. Although the Canadian experience with roundabouts is quite limited, compared to the United States and other European countries, the benefits of roundabouts have drawn growing interest, and roundabouts are being constructed increasingly in recent years in Canada. However, more research is needed to understand the safety effect of roundabouts. Accordingly, the effect of inclement weather on roundabouts safety and the safety effect of conversion from traditional stop sign and signal control intersections to modern roundabouts will be investigated. However, to study the safety effect of roundabouts, some conventional methods do not fit well the usual circumstances of observational studies. Thus, examples will be provided to show some challenges in analyzing roundabouts safety. The matched-pair approach will be demonstrated as an effective approach for quantifying the effect of inclement weather on roundabouts safety. Furthermore, the empirical Bayes procedure is used to analyze the safety effect of converting traditional stop sign and signal control intersections to roundabouts.

Keyword: roundabouts, safety effect, weather, empirical Bayes