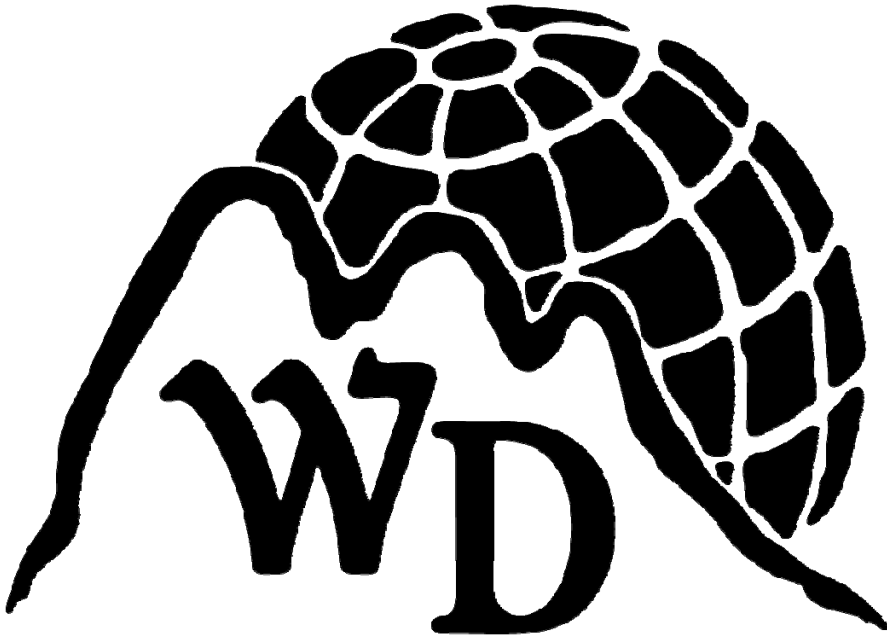


WDCAG 2011

Welcome to the 2011 WDCAG annual conference!

We are delighted to have the opportunity to host this important annual event at Simon Fraser University this year. The conference has attracted a record number of presenters and attendees, which is an accomplishment that we are quite proud of.

As a reminder, the theme of this year's WDCAG conference is *Habitat for Diversity*. This theme was proposed by an undergraduate student in the Department of Geography here at Simon Fraser University. We adopted it as we think it characterizes many contemporary aspects of the discipline. Habitats are places that are inhabited by particular species, while diversity has numerous interpretations ranging from biodiversity (or species richness) to an expression of variety. The *Habitat for Diversity* theme has many potential interpretations, one of which is that we hope the conference itself becomes a habitat or environment that promotes the sharing of diverse geographic ideas.

There will be a wealth of geographic knowledge shared over the coming days. We encourage you to take in the new ideas that will be shared here and to speak with as many new people as possible so that you can expand your personal and collegial networks.

There are a number of social events that will transpire throughout the course of the conference. On Thursday evening there is an icebreaker event. On Friday evening there is a reception following the plenary talk. There are coffee breaks scheduled throughout the day on Saturday. And, of course, the biggest social event is the Saturday evening banquet. We hope that you're able to enjoy all of these events. Be sure to encourage your colleagues to attend.

We would also like to take this opportunity to acknowledge the contributions of the following units and institutions: the Department of Geography (SFU), the Faculty of Environment (SFU), the office of the Vice President Academic (SFU), and ESRI Canada. Last but not least, we would like to extend a big thank you to all of our student volunteers!

Enjoy the conference,

The Co-Organizers & Conference Organizing Committee

SFU SIMON FRASER UNIVERSITY
THINKING OF THE WORLD

Welcome Conference Attendees,

On behalf of Geography at Simon Fraser University and our home in the new Faculty of Environment, it is a great pleasure for me to welcome you to the 2011 annual meetings of the WDCAG. It is gratifying to see to so many participants who collectively represent the depth and breadth of contemporary Geography. Indeed, the program, and its theme of Habitat for Diversity, is a reminder of Geography's remarkable variety and distinctiveness as an inter-disciplinary discipline. There are four paper sessions each comprising seven concurrent, different discussions, in total involving well over 200 registered participants who represent institutions throughout the Division, and even beyond. This exciting program is further enlivened by field trips, a banquet and other get-togethers, and of course by a much anticipated plenary presentation from Alisa Smith, a well known author and media celebrity on local food systems – an applied geographer from the real world! Her renown also further reminds us, in addition to your own presence, of the importance of the meetings of the WDCAG – this is the 53rd – as a *local* meeting place for the exchange of ideas and knowledge, the tacit awareness of the evolving nature of geography, and by no means least for social and convivial bonding. While I regret that I cannot personally attend because of a prior commitment (in northern Norway) I wish you all a thoroughly enjoyable, productive meeting and visit to Simon Fraser University. I thank you all for allowing us the pleasure to be your hosts, and a very particular thanks to Ilja and Valorie, and their committee of graduate students, who happily and voluntary initiated and organized this meeting, and to such good effect. You may wish to buy them a drink; if in their cases your offer has to be non-alcoholic, you need not feel so restricted! Have a wonderful weekend.

Dr. Roger Hayter

Chair, Department of Geography

Simon Fraser University

Welcome from the President of the Western Division of the Canadian Association of Geographers

As President of the Western Division of the Canadian Association of Geographers, it is my great pleasure to welcome you to the Division's 2011 Annual Meeting. Under the theme "Habitat for Diversity", the conference hosted by the Department of Geography at Simon Fraser University is the 53rd in the long history of the Western Division of the Canadian Association of Geographers.

I would like to extend a special welcome to all undergraduate and graduate students for whom this may be their first participation at an academic conference. I also extend special salutations to our distinguished colleagues from cognate disciplines and to members of the local community that have come to celebrate with us this three-day community building event centered around the sharing of geographic research and knowledge. Please join us in taking advantage of the field trips, the paper and poster presentations and the many social activities scheduled as part of this wonderful conference.

On behalf of the Western Division of the Canadian Association of Geographers I would like to sincerely thank members of the Local Organizing Committee for their hard work, commitment and dedication to ensure that the conference is a resounding success.

Sincerely,

Gilles Viaud Ph.D.

Thompson Rivers University

WDCAG 2011 Public Lecture

Friday, March 11, 2011

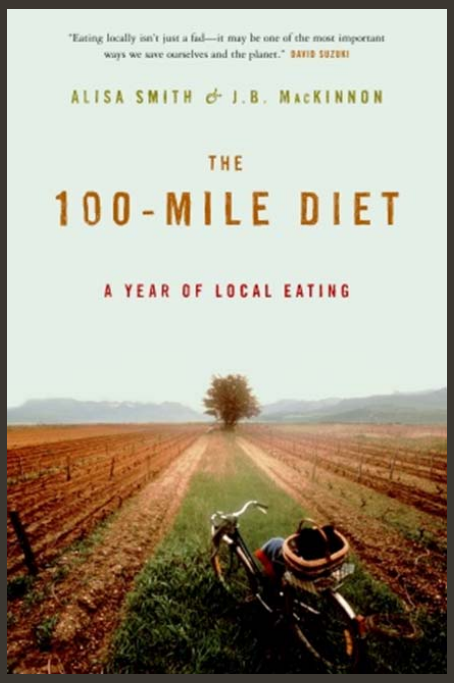
7:30-9:00pm

Simon Fraser University
Saywell Hall - Room #10081

Keynote Speaker:

Alisa Smith

co-author of
the 100-mile diet
and co-host of
the 100-mile challenge
TV series



FREE EVENT!!

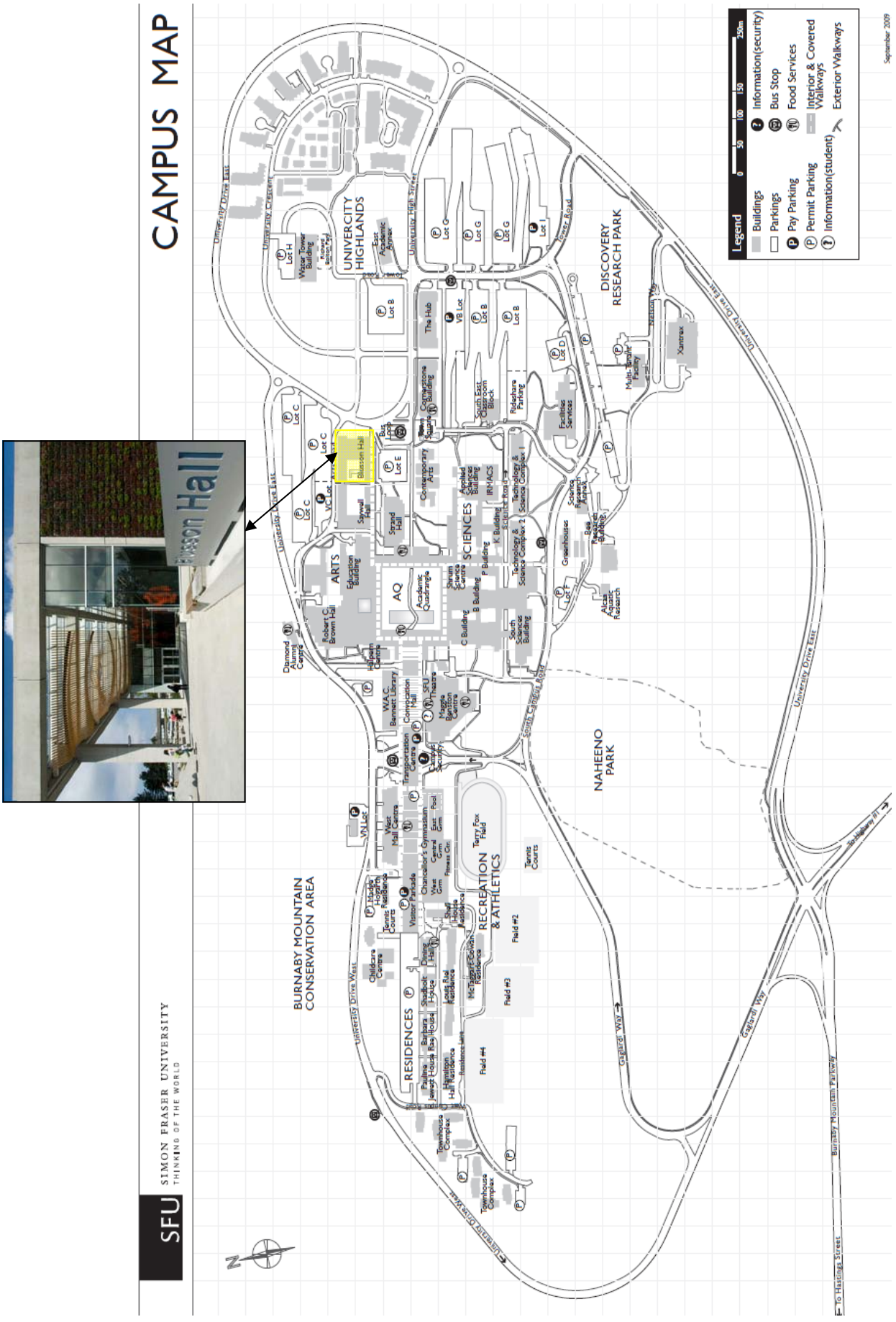
Seating will be *first come first served*

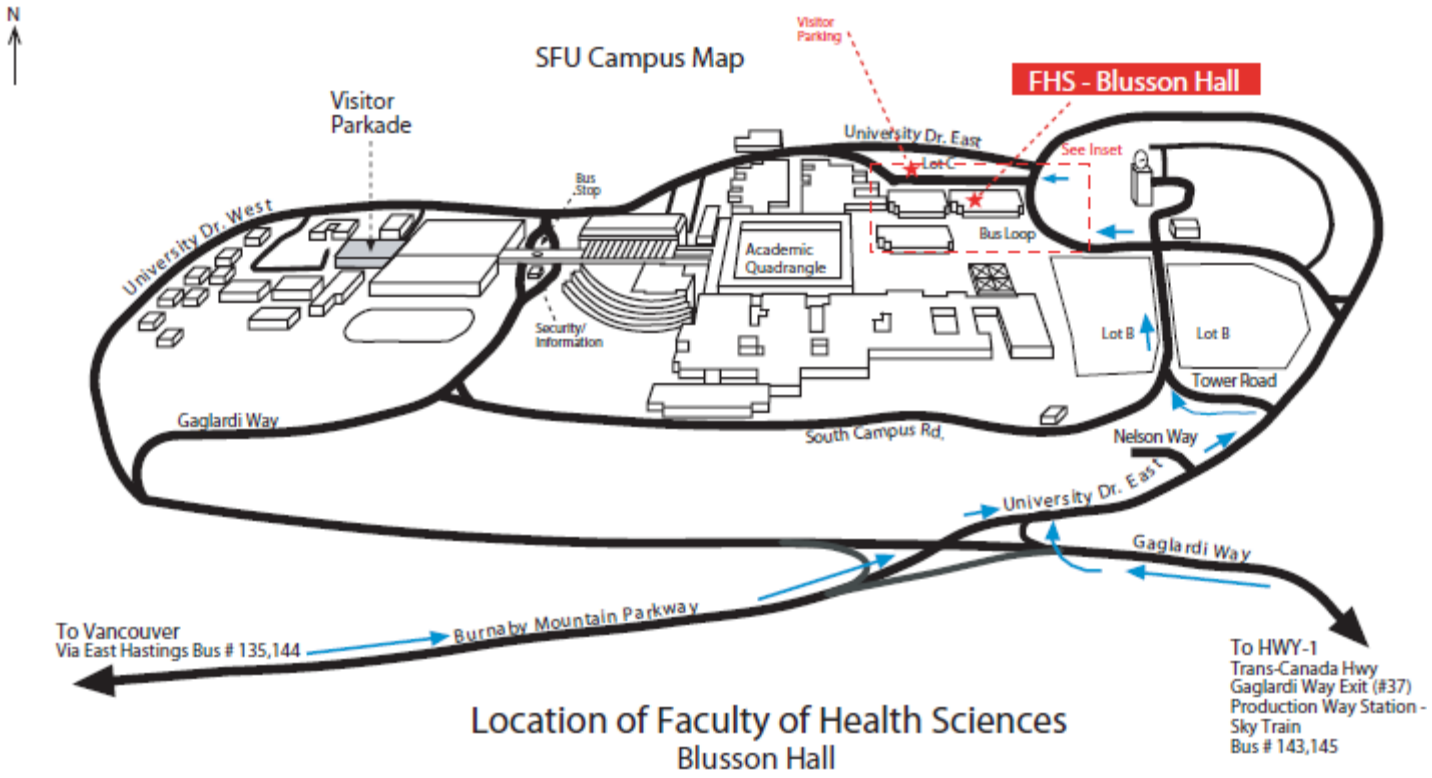
For more info:
www.sfu.ca/wdcag2011

Sponsored by:

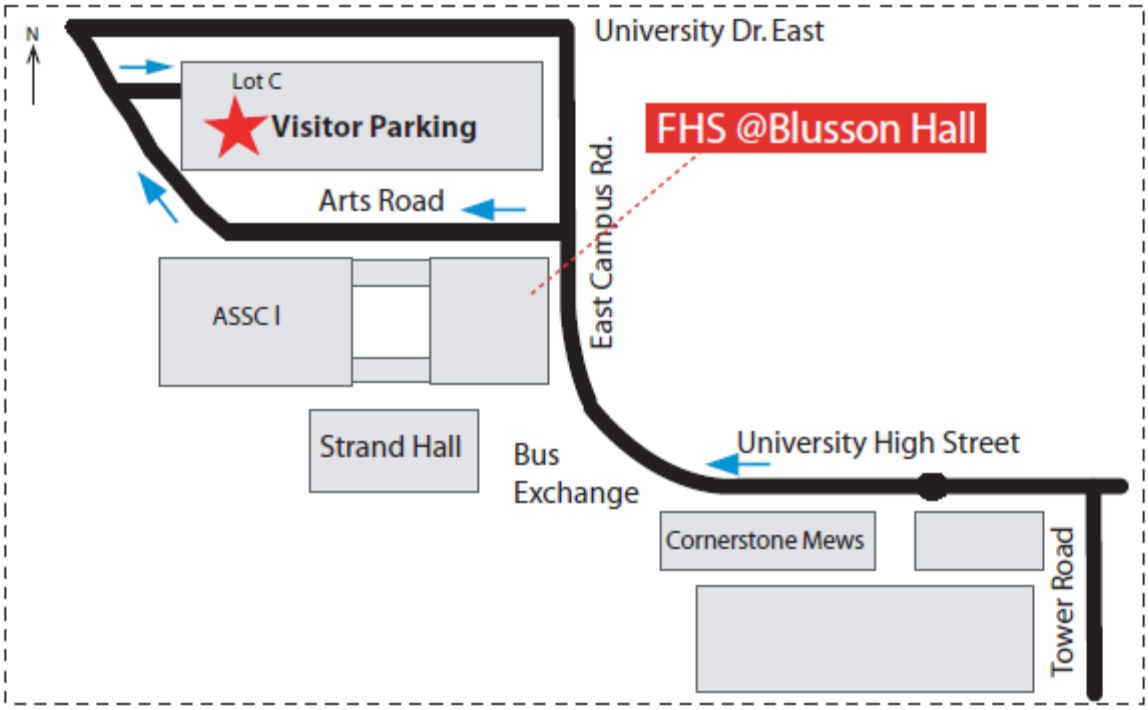
SFU SIMON FRASER UNIVERSITY THINKING OF THE WORLD

Faculty of Environment
Vice President Academic


CAMPUS MAP
SFU
SIMON FRASER UNIVERSITY
THINKING OF THE WORLD
Blusson Hall
Legend
Buildings
Parkings
Pay Parking
Permit Parking
Information(student)
Information(security)
Bus Stop
Food Services
Interior & Covered Walkways
Exterior Walkways
September 2009
UNIVERCITY HIGHLANDS
DISCOVERY RESEARCH PARK
NAHEENO PARK
BURNABY MOUNTAIN CONSERVATION AREA
ARTS
SCIENCES
AQ
RECREATION & ATHLETICS
RESIDENCES
University Drive East
University Drive West
Gaglardi Way
Burnaby Mountain Parkway
To Hastings Street



Location of Faculty of Health Sciences
Blusson Hall



Schedule of Sessions – Saturday March 12, 2011

	Room A Blusson Hall 10655	**Room B** Blusson Hall 10901	**Room C** Blusson Hall 11901	**Room D** Blusson Hall 10921	**Room E** Blusson Hall 10021	**Room F** Blusson Hall 10011	**Room G** Blusson Hall 10031	**Blusson Hallway**
Session 1 8:30-10:00	Spatial Analysis	Precipitation, Throughfall, & Stemflow	Geomorphol-ogy	Geographic Imaginations & Textual Landscapes	Political Geography & Border Making	First Nations & the Construction of Landscapes	Conservation & Communities I – The Socio-Economics of Environmental Conservation	**Poster Session 1 (8:15-12:15)**
10:00-10:30	***Morning Coffee Break***							
Session 2 10:30-12:00	Spatial Modeling	Snow, Snowmelt, & Glacial Melt	Waste Manage-ment	Approaches, Methods, & Practices	Urban Geography	Northern Governance & Human / Environment Relations	Conservation & Communities II – Local Values in Environmental Management and Conservation Governance	
12:00-13:00	***Lunch***							**Poster Session 2 (12:45-16:45)**
Session 3 13:00-14:30	GIS & Health	Glaciers	Wetland Hydrology	Social & Cultural Geographies	Urban Land Use	Resource and Environmental Management	Community Engagement Methods Panel	
14:30-15:00	***Afternoon Coffee Break***							
Session 4 15:00-16:30	Health Geography	Dendrochronol-ogy	Water Quality & Rivers	Economic Geographies	Geographies of Food	Ecosystem & Land Use Management	Bio-Economies & Biogeographies	
16:30-17:30	***WDCAG Annual General Meeting (Blusson Hall 10021)***							

CONFERENCE AGENDA

Thursday, March 10, 2011

Registration (in front of Saywell Hall 10081): 18:00-20:30
Icebreaker (Club Ilia — Cornerstone Mews Building [see map on page 8]): 20:00-22:30

Friday, March 11, 2011

Registration (in front of Saywell Hall 10081): 8:30-11:00 and 16:00-19:30
Fieldtrips: 9:00-16:00
Keynote lecture (Saywell Hall 10081): 19:30-21:00
Reception (Diamond Alumni Centre): 21:00- 23:00

Saturday March 12

Registration (in front of Blusson Hall 10655): 8:00-15:00
Paper and Poster Presentations (Blusson Hall): 8:30-16:30
WDCAG Annual General Meeting (Blusson Hall 10021): 16:30-17:30
Banquet (Diamond Alumni Centre): 18:00-23:00

PAPER SESSIONS

Session 1: 8:30-10:00

SESSION 1A: SPATIAL ANALYSIS (BLUSSON HALL 10655)

8:30-8:50 **QUANTIFYING FRESHWATER ICE ACROSS THE NORTHERN HEMISPHERE USING GIS AND A DEGREE-DAY ICE GROWTH MODEL**
Rheannon N. Brooks, Terry D. Prowse and Ian J. O'Connell
University of Victoria

8:50-9:10 **GEOSTATISTICAL ANALYSIS AND MAPPING OF ENVIRONMENTAL DATA PATTERN**
Michael Govorov, Vancouver Island University and Gennady Gienko, University of Alaska

9:10-9:30 **THE DIRECTIONAL BEHAVIOUR OF CRIMINALS IN DIFFERENT URBAN FORMS**
Martin A. Andresen, Richard Frank, and Patricia L. Brantingham
Simon Fraser University

9:30-9:50 **A GEOGRAPHIC INFORMATION SYSTEM (GIS) FOR MUNICIPALLY ENABLED SUSTAINABLE AGRICULTURE (MESA)**
Dr. Parthiphan Krishnan
Kwantlen University

SESSION 1B: PRECIPITATION, THROUGHFALL, & STEMFLOW (BLUSSON HALL 10901)

8:30-8:50 **SPATIAL VARIABILITY OF WINTER SNOW ACCUMULATION IN THE OKANAGAN RIVER BASIN, BC**
Tallina McRae, Dr. Fes deScally, & Dr. David Scott
University of British Columbia's Okanagan Campus

8:50-9:10 **CHEMICAL PROPERTIES OF THROUGHFALL, STEMFLOW AND FOREST FLOOR BENEATH BIGLEAF MAPLE IN A CONIFEROUS FOREST IN THE PACIFIC NORTHWEST**
Khaled Hamdan and Margaret Schmidt
Simon Fraser University

9:10-9:30 STEMFLOW IN A MATURE COASTAL BRITISH COLUMBIA FOREST
Sheena A Spencer and Ilja Tromp-van Meerveld
Simon Fraser University

SESSION 1C: GEOMORPHOLOGY (BLUSSON HALL 11901)

8:30-8:50 **QUATERNARY STRATIGRAPHY OF THE CENTRAL OKANAGAN VALLEY, BRITISH COLUMBIA [THOMSON]**
Robert R. Young and Skye Thomson
University of British Columbia

8:50-9:10 **EXPLORING THE NORTHERN EXTENT AND PUTATIVE DRAINAGE ROUTE OF GLACIAL LAKE KOOTENAI IN THE KOOTENAY VALLEY, BC: PRELIMINARY FINDINGS**
Jared Peters and Tracy Brennand
Simon Fraser University

9:10-9:30 **TURBULENT AIRFLOW AND SEDIMENT TRANSPORT OVER A VEGETATED FORDUNE, PEI NATIONAL PARK, CANADA**
Connie Chapman, Ian J. Walker
University of Victoria

9:30-9:50 **DETERMINING THE OPTIMAL PROTOCOL FOR OPTICAL DATING OF EOLIAN LANDFORMS IN THE FOOTHILLS OF SOUTHERN ALBERTA**
Justine R. Cullen, Olav B. Lian, and Stephen A. Wolfe
University of the Fraser Valley

SESSION 1D: GEOGRAPHIC IMAGINATIONS & TEXTUAL LANDSCAPES (BLUSSON HALL 10921)

8:30-8:50 **WATCHING AVATAR IN ALBERTA: CAN REFLEXIVITY CLOSE PANDORA'S BOX?**
Dr. Michael P. Ferber and Dr. Randolph Haluza-Delay
The Kings University College

8:50-9:10 **LOOKOUT ARMAGEDDON: BATTLEFIELD TOURISM AND BLOOMING LANDSCAPE IMAGINATIONS OF CHRISTIAN ZIONISTS**
Tristan Sturm
University of British Columbia

9:10-9:30 **WHEN TO STOP…WHAT TO SEE AND DO: REFLECTIONS ON GEOGRAPHY OF JAPAN FIELD TRIPS IN 2008 AND 2010**
Tom Waldichuk
Thompson Rivers University

9:30-9:50 **ON NATURAL & CULTURAL DIVERSITY OF SHANGRI-LA REGION AND A DEVELOPMENT MODEL**
Kejian Xu
China University of Geosciences

SESSION 1E: POLITICAL GEOGRAPHY & BORDER MAKING (BLUSSON HALL 10021)

8:30-8:50 **A DECONSTRUCTION OF CROSS BORDER COOPERATION THEORY: DISTILLATION INTO FOUR DIMENSIONS**
Riley Jones and Patrick Buckley
Western Washington University

8:50-9:10 **THE PACIFIC ARROWSMITH TRAIL ON VANCOUVER ISLAND**
Charles York and Shawna Wagner
Vancouver Island University

9:10-9:30 **PERFORMING PRIVILEGE FOR PEACE: PROTECTIVE ACCOMPANIMENT IN COLOMBIA**
Sara Koopman
Kwantlen University

SESSION 1F: FIRST NATIONS & THE CONSTRUCTION OF LANDSCAPES (BLUSSON HALL 10011)

8:30-8:50 **INVENTING THE 'SALISH SEA': TOPONYMIC RESCALING, PERFORMATIVITY, AND THE MAKING OF TRANSNATIONAL SPACES**
Brian Tucker, Dr. Reuben Rose-Redwood
University of Victoria

8:50-9:10 **MAKING THE INVISIBLE VISIBLE: A NEW CARTOGRAPHY OF THE STONEY NATION IN KANANASKIS COUNTRY, ALBERTA**
Paul Stephany
University of the Fraser Valley

9:10-9:30 **DRIFTWOOD DOMINOES: LANDSCAPE HEGEMONY FROM SCOTLAND TO THE CANADIAN PLAINS**
Michael C. Wilson
Douglas College

SESSION 1G: CONSERVATION & COMMUNITIES I: THE SOCIO-ECONOMICS OF ENVIRONMENTAL CONSERVATION (BLUSSON HALL 10031)

8:30-8:48 **THE MOTORS OF ECOTOURISM REV IN TORTUGERO, COSTA RICA**
Nick Ehlers and Zoë A. Meletis
University of Northern British Columbia

8:48-9:06 **COMMUNITY-BASED ECOTOURISM IN GHANA: THE QUANDARY OF THE BOABENG-FIEMA MONKEY SANCTUARY**
L-A Shibish
Vancouver Island University

9:06-9:24 **BALANCING CONSERVATION WITH RURAL LIVELIHOODS, POVERTY AND FOOD SECURITY IN TANZANIA**
Bruce K. Downie
University of Victoria

9:24-9:42 **USING MARXAN TO INCLUDE COMMUNITY SOCIO-ECONOMIC VALUES IN CONSERVATION PLANNING**
Heather M. Coleman (Pacific Marine Analysis and Research Association) and Dave Nicolson (BC Marine Conservation Analysis)

SESSION 2A: SPATIAL MODELING (BLUSSON HALL 10655)

10:30-10:50 **SIMULATION OF URBAN LANDSLIDES : CELLULAR AUTOMATA APPROACH**
Terence Lai and Suzana Dragićević
Simon Fraser University

10:50-11:10 **SPATIAL DISAGGREGATION OF THE UNIVERSAL SOIL LOSS EQUATION USING A CELLULAR AUTOMATA APPROACH**
Laurens Bakker, Brandon Heung, Suzana Dragićević, Margaret G. Schmidt
Simon Fraser University

11:10-11:30 **AUTOMATED PROCEDURE FOR DIGITAL LANDSCAPE CLASSIFICATION BASED ON DEM DATA AND FUZZY LOGIC**
Brandon Heung (Simon Fraser University), Chuck E. Bulmer (Research Branch, BC Ministry of Forests and Ranges), Margaret G. Schmidt (Simon Fraser University)

11:30-11:50 **USING ALOS/PALSAR, RADARSAT-2 AND ENVISAT/ASAR IMAGERY TO DEFINE THREATENED SPECIES HABITATS IN THE BRAZILIAN PANTANAL**
Teresa Evans, Maycira Costa, Walfrido Tomas, Thiago Silva, Kevin Telmer
University of Victoria

SESSION 2B: SNOW, SNOWMELT, & GLACIAL MELT (BLUSSON HALL 10901)

10:30-10:50 **DIGGING THE LOW DOWN - TRACKING WINTER STORMS AND THEIR SIGNATURES ON THE COLUMBIA ICEFIELD.**
Selena Raven Cordeau
University of Victoria

10:50-11:10 **SOLAR RADIATION OBSERVATIONS IN THE SOUTHERN COAST MOUNTAINS OF BRITISH COLUMBIA**
Joseph M. Shea and R. Dan Moore
University of British Columbia

11:10-11:30 **TWENTIETH CENTURY GLACIER CHANGE AND SURFACE RUNOFF MODELING, CANOE BASIN, B.C.**
Teresa Brewis and Brian Menounos
University of Northern British Columbia

SESSION 2C: WASTE MANAGEMENT (BLUSSON HALL 11901)

10:30-10:50 **COOPERATIVE RECYCLING: EQUITY, EMPOWERMENT, AND THE REINSCRITION OF GENDERED DIFFERENCE**
Neil Nunn and Jutta Gutberlet
University of Victoria

10:50-11:10 **SPATIAL (IN)EQUITY AND RESISTANCE: WASTE, EVERYDAY LIFE, AND 'THE MARGINS'**
Hudson McFann
University of Toronto

11:10-11:30 **THE URBAN GEOGRAPHY OF WASTEWATER IN MEXICO: A COMPARATIVE ANALYSIS WITHIN THE LERMA-CHAPALA RIVER BASIN**
Raul Pacheco-Vega
University of British Columbia

SESSION 2D: APPROACHES, METHODS, & PRACTICES (BLUSSON HALL 10921)

10:30-10:50 **KNOWLEDGE TO ACTION: A FRAMEWORK FOR ENGAGING FIRST NATIONS IN ENVIRONMENTAL HEALTH RESEARCH**
Leana Garraway and Dr. Neil Hanlon
University of Northern British Columbia

10:50-11:10 **THE BENEFITS OF NON-VISUAL MAPPING FOR INDIVIDUALS AND COMMUNITIES**
Cail Smith
University of Victoria

11:10-11:30 **THE POTENTIAL OF MULTIDISCIPLINARY APPROACHES TO ANALYSING AND DESCRIBING PLACE**
Kim Naqvi, Tom Waldichuk, Ila Crawford, Lyn Baldwin, Ginny Ratsoy, Elizabeth Templeman, Tina Block, Lisa Cooke
University of Alberta, Thompson Rivers University

11:30-11:50 **STRUGGLES WITH MY HISTORICAL ATLAS OF MEDICINE HAT: PLODDING PROGRESS, PROBLEMATIC PATRONAGE AND PERSONAL PROBLEMS**
Ben Moffat
Athabasca University and Medicine Hat College

SESSION 2E: URBAN GEOGRAPHY (BLUSSON HALL 10021)

10:30-10:50 **URBAN ENTREPRENEURSHIP AND THE VANCOUVER 2010 WINTER OLYMPIC GAMES**
George Rahi
University of British Columbia

10:50-11:10 **THE ROLE OF PLACE PROMOTION AND URBAN IMAGE IN CITIES' DEVELOPMENT AND MARKETING OF RAPID MASS TRANSIT (RMT) SYSTEMS**
Andrew McLellan and Dr. Damian Collins
University of Alberta

11:10-11:30 **THE DEATH AND LIFE OF THE LITTLE MOUNTAIN HOUSING PROJECT: BC'S FIRST PUBLIC HOUSING COMMUNITY**
Tommy Thomson
University of British Columbia

SESSION 2F: NORTHERN GOVERNANCE & HUMAN/ ENVIRONMENT RELATIONS (BLUSSON HALL 10011)

10:30-10:50 **DIVERSITY OF NATURAL RESOURCE REGIMES IN NORTHERN CANADA**
Julia MacKenzie
Indian and Northern Affairs, Resource Policy and Programs Directorate

10:50-11:10 **PIPELINE POLITICS AND ENVIRONMENTAL GOVERNANCE: (DIS)CONNECTING ALBERTA'S TAR SANDS AND B.C.'S NORTH COAST**
Ryan Vandecasteyen and Philippe Le Billon
University of British Columbia

11:10-11:30 **JOINT MANAGEMENT IN PROTECTED AREAS: WHAT IS IN IT FOR FIRST NATIONS IN BRITISH COLUMBIA?**
Julia Schwamborn
University of Northern British Columbia

11:30-11:50 **A CASE FOR 'REPATRIATING' RESEARCH: A REVIEW OF ENVIRONMENTAL GOVERNANCE ON HAIDA GWAII**
Lindsay Galbraith and Professor Susan Owens
University of Cambridge

SESSION 2G: CONSERVATION & COMMUNITIES II: LOCAL VALUES IN ENVIRONMENTAL MANAGEMENT AND CONSERVATION GOVERNANCE (BLUSSON HALL 10031)

10:30-10:48 **THE ESTABLISHMENT OF SOVIET/POST-SOVIET NATIONAL PARKS: A SOCIO-POLITICAL PERSPECTIVE**
Michael Tripp
Vancouver Island University

10:48-11:06 **PLANNING ECOLOGICAL RESTORATION FOR RUBBER PLANTATIONS: INSIGHTS FROM POLITICAL ECOLOGY AND FARMERS' PERSPECTIVES IN XISHUANGBANNA, CHINA**
Noah Schillo
Simon Fraser University

11:06-11:24 **EXPLORING THE PLACE OF A BIOSPHERE RESERVE IN THE IGALIRTUUQ CONSERVATION INITIATIVE, CLYDE RIVER NUNAVUT**
John L. Kearns and Maureen G. Reed
University of Saskatchewan

11:24-11:42 **FIRST NATIONS VALUES AND GOALS IN PROTECTED AREA GOVERNANCE**
Grant Murray and Leslie King
Vancouver Island University

11:42-12:00 **DIGGING IN THE SAND: EXPLORING THE CONFLICT BETWEEN INDIGENOUS RIGHTS AND BIODIVERSITY CONSERVATION THROUGH ABORIGINAL CLAM GARDENS**
Skye Augustine and Phil Dearden
University of Victoria

Session 3: 13:00-14:30

SESSION 3A: GIS & HEALTH (BLUSSON HALL 10655)

13:00-13:20 **ENABLING PUBLIC HEALTH SURVEILLANCE IN LOW AND MIDDLE-INCOME COUNTRIES: THE ROLE OF WEB 2.0 AND GEOWEB TECHNOLOGIES**
Jonathan Cinnamon and Nadine Schuurman
Simon Fraser University

13:20-13:40 **EXAMINING THE SPATIAL ACCESSIBILITY OF TRAUMA SERVICES IN CANADA USING GEOGRAPHIC INFORMATION SYSTEMS**
Fiona Lawson (Simon Fraser University), Nadine Schuurman (Simon Fraser University), Lisa Oliver (Statistics Canada), and Avery Nathens (St. Michael's Hospital, Toronto)

13:40-14:00 **OBESITY AND THE BUILT ENVIRONMENT: A CLUSTER ANALYSIS OF URBAN AND PERI-URBAN COMMUNITIES IN THE GREATER VANCOUVER REGIONAL DISTRICT**
Charles Fritz, Nadine Schuurman, Scott Lear
Simon Fraser University

14:00-14:20 **TOWARDS A SOCIO-SPATIAL FRAMEWORK FOR UNDERSTANDING PHYSICAL BARRIERS TO SERVICES AND AMENTIES FOR PEOPLE WITH MOBILITY ISSUES**
Jessica Blewett and Dr. Neil Hanlon
University of Northern British Columbia

SESSION 3B: GLACIERS (BLUSSON HALL 10901)

13:00-13:20 **LATE HOLOCENE GLACIER ACTIVITY IN THE MOUNT WADDINGTON AREA, CENTRAL BRITISH COLUMBIA COAST MOUNTAINS**
Bethany Coulthard, Jill Harvey, Dan Smith
University of Victoria

13:20-13:40 **NINE DECADES OF GLACIER CHANGE IN THE ROCKY MOUNTAINS, CANADA**
Christina Tennant, Brian Menounos, Roger Wheate, and John J. Clague
University of Northern British Columbia

13:40-14:00 **STRUCTURAL GLACIOLOGY UPGLACIER OF A TRIBUTARY-TRUNK JUNCTION**
Thomas Fox and Hester Jiskoot
University of Lethbridge

14:00-14:20 **LICHENOMETRIC INVESTIGATIONS OF LITTLE ICE AGE GLACIER ACTIVITY IN THE CENTRAL BRITISH COLUMBIA COAST MOUNTAINS**
Harvey, Jill E., Smith, Dan J., Desloges, Joseph R.
University of Victoria and University of Toronto

SESSION 3C: WETLAND HYDROLOGY (BLUSSON HALL 11901)

13:00-13:20 **VEGETATION VARIATION ACROSS LAGG FORMS OF RAISED BOGS IN COASTAL BRITISH COLUMBIA**
Sarah Howie and Ilja Tromp-van Meerveld
Simon Fraser University

13:20-13:40 **THE HYDROLOGIC RESPOSE OF A SMALL FORESTED SWAMP COMPLEX**
John E. Martin
Kwantlen University

13:40-14:00 **THE INS AND OUTS OF BURNS BOG: A LOOK INTO THE WATER BALANCE OF A LARGE OMBROTROPHIC BOG IN THE FRASER VALLEY**
Yue-Ching Cheng and Ilja Tromp-van Meerveld
Simon Fraser University

SESSION 3D: SOCIAL & CULTURAL GEOGRAPHIES (BLUSSON HALL 10921)

13:00-13:20 **THE 'BODY' AS A SPACE: SKIN DEEP DESTINIES & THEORETICAL PARADOXES(?) OF HUMAN GEOGRAPHY"**
Hollie McKeil
University of British Columbia

13:20-13:40 **LANDSCAPES OF DRAG: PERFORMATIVITY AND COMMODIFICATION OF THE CULTURAL LANDSCAPES IN VICTORIA'S CHINATOWN**
Andrew Shopland
University of Victoria

13:40-14:00 **"MY RIVER, MY HOME" - A TESTIMONY OF THE FRASER RIVER THROUGH THE PERCEPTION OF CHILDREN.**
Steven Marsh (University of the Fraser Valley), Shana Roberts(Independent Consultant), Cherie Enns (University of the Fraser Valley), Bernhard Peucker-Ehrenbrink (Woods Hole Oceano-graphic Institution),
Robert M. Holmes (Woods Hole Research Center)

14:00-14:20 **VANCOUVER'S AURATIC GEOGRAPHIES: PHOTOGRAPHY AT THE VANCOUVER ART GALLERY**
Jamison Miller
Simon Fraser University

SESSION 3E: URBAN LAND USE (BLUSSON HALL 10021)

13:00-13:20 **COMPARING 'SUSTAINABLE' COMMUNITIES: SOUTHEAST FALSE CREEK AND DOCKSIDE GREEN"**
Don Alexander and Christine Krumrey
Vancouver Island University

13:20-13:40 **RESILIENCE AND THE DIVERSITY OF LAND-USES: HOW DIVERSE LAND-USES CAN HELP BUILD A RESILIENT CITY THAT IS ECONOMICALLY COMPETITIVE**
Duncan Wlodarczak
Simon Fraser University

13:40-14:00 **INFILL AS AN ALTERNATE TO GREENFIELD DEVELOPMENT: BARRIERS AND BENEFITS**
Steven Beasley
University of Victoria

14:00-14:20 **AN ANALYSIS OF THE CULTURAL AND ENVIRONMENTAL SIGNIFICANCE OF URBAN GREEN SPACES: NANAIMO, B.C.**
Angie Nielsen
Vancouver Island University

SESSION 3F: RESOURCE AND ENVIRONMENTAL MANAGEMENT (BLUSSON HALL 10011)

13:00-13:20 **SOCIAL AND HEALHT VULNERABILITY TO EARTHQUAKES IN THE CAPITAL REGIONAL DISTRICT, BRITISH COLUMBIA CANADA**
Sarah Stoner and Denise Cloutier-Fisher
University of Victoria

13:20-13:40 **MEASURING THE CARBON SEQUESTRATION POTENTIAL OF EXTENSIVE GREEN ROOFS – PART 1: A COMPARATIVE PLANT PHYSIOLOGY EXPERIMENT**
Keri Bowering
Vancouver Island University

13:40-14:00 **THE MANAGEMENT OF WATER QUALITY IN BRITISH COLUMBIA AND NEWFOUNDLAND & LABRADOR**
Jackie Peat and Marilyn Tse
University of British Columbia

14:00-14:20 **MANAGEMENT OF SMALL WATER STORAGES: A CASE STUDY OF SMALL FARM DAMS IN NEW ZEALAND**
Jan Thompson
Victoria University of Wellington and Kwantlen Polytechnic University

SESSION 3G: COMMUNITY ENGAGEMENT METHODS PANEL (BLUSSON HALL 10031)

13:00-14:30 Funding agencies are increasingly calling for collaborative research between community partners and academics. These collaborative frameworks often present a challenge to student research activities – both in terms of researcher training and timelines. The quality and effectiveness of student research experiences, however, will have longstanding impacts on their future research careers, as well as repercussions pertaining to the community experience with the research process. The purpose of this workshop is to provide students with information about how to get the most out of their research experience. Key topics to be addressed include finding community research opportunities, identifying what you should know and what you should ask before engaging with a research team, how to obtain a breadth of research skills and experiences, researcher etiquette and demeanour in the community, budgeting, time management, and developing future research and employment prospects. Speakers: Laura Ryser (University of Northern BC), Greg Halseth (University of Northern BC), Sean Markey (Simon Fraser University).

Session 4: 15:00-16:30

SESSION 4A: HEALTH GEOGRAPHY (BLUSSON HALL 10655)

15:00-15:20 **AGING IN PLACE(LESSNESS)**
Theresa D. Garvin
University of Alberta

15:20-15:40 **DIVERSITY IN END-OF-LIFE FAMILY CAREGIVING: IMPLICATIONS FOR CANADA'S COMPASSIONATE CARE BENEFIT**
Melissa Giesbrecht, Valorie A. Crooks, Allison Williams, Olena Hankivsky
Simon Fraser University

15:40-16:00 **INFORMED CONSENT AND CANADIAN MEDICAL TOURISM WEBSITES: ASSESSING A PRIMARY INFORMATION SOURCE FOR MEDICAL TOURISTS**
Kali Penney, Jeremy Snyder, Valorie A. Crooks, Rory Johnston
Simon Fraser University

16:00-16:20 **WHO ARE CANADA'S MEDICAL TOURISTS? AN ACCOUNT OF CANADIANS' INVOLVEMENT IN MEDICAL TOURISM FROM THE PERSPECTIVES OF FACILITATORS**
Rory Johnston, Valorie A Crooks, Krystyna Adams, Paul Kingsbury, Jeremy C Snyder
Simon Fraser University

SESSION 4B: DENDROCHRONOLOGY (BLUSSON HALL 10901)

15:00-15:20 **350-YEAR DENDROHYDROLOGICAL RECONSTRUCTIONS FOR TWO NIVAL BASINS IN WEST CENTRAL BRITISH COLUMBIA**
Colette Starheim, Dan J. Smith, and Terry Prowse
University of Victoria

15:20-15:40 **DIVING FOR GIANTS: A DENDROLACUSTRINE INVESTIGATION IN THE BELLA COOLA AREA, BRITISH COLUMBIA**
Kara Pitman and Dan Smith
University of Victoria

15:40-16:00 **DENDROGLACIOLOGICAL INVESTIGATIONS AT SOUTH MORE GLACIER, NORTHERN BRITISH COLUMBIA COAST MOUNTAINS**
Jessica Craig, Dan Smith and Dave Lewis
University to Victoria

SESSION 4C: WATER QUALITY & RIVERS (BLUSSON HALL 11901)

15:00-15:20 **VARIATION OF FRASER RIVER, KANAKA CREEK AND SILVER CREEK GEOCHEMISTRY, BRITISH COLUMBIA**
Steven Marsh, Sharon Gillies, Alida Janmaat, Jenna Fanslau, Bryce Downey, Bernhard Peucker-Ehrenbrink, Britta Voss, Ekaterina Bulygina, Gregory Fiske, Timothy Eglinton, Daniel Montluçon, Helena Fraser, Garrett Macklam-Harron, Brayden Wiebe, Michelle Martinec, Carl Johnson, and Scot Birdwhistell
University of the Fraser Valley, Woods Hole Oceanographic Institution, Eidgenössische Technische Hochschule, Woods Hole Research Center

15:20-15:40 **PROGRESS TOWARDS ACOUSTIC SUSPENDED SEDIMENT TRANSPORT MONITORING: FRASER RIVER, BC**
Maureen Attard, Jeremy Venditti, Michael Church
Simon Fraser University

15:40-16:00 **CONTROLS ON SEDIMENT PRODUCTION FROM FOREST ROADS IN A PACIFIC MARITIME WATERSHED**
Elizabeth Baird and Ilja Tromp-van Meerveld
Simon Fraser University

16:00-16:20 **THE INFLUENCE OF DISCHARGE ON HYPORHEIC EXCHANGE IN A SMALL URBAN STREAM**
Jacquelyn Shrimer and Ilja Tromp-van Meerveld
Simon Fraser University

SESSION 4D: ECONOMIC GEOGRAPHIES (BLUSSON HALL 10921)

15:00-15:20 **RECESSIONS AND RESTRUCTURING IN ECONOMIC GEOGRAPHY: THE EVOLUTION OF BRITISH COLUMBIA'S FOREST SECTOR 1980 -2010**
Klaus Edenhoffer and Roger Hayter
Simon Fraser University

15:20-15:40 **UNDERSTANDING INDUSTRIAL AND URBAN RESTRUCTURING TRAJECTORIES USING FIRM DEMOGRAPHICS AS A METHODOLOGICAL TOOL: A CASE STUDY OF THE MEXICAN LEATHER AND FOOTWEAR CLUSTERS**
Raul Pacheco-Vega
University of British Columbia

15:40-16:00 **NEW RELATIONSHIPS BETWEEN JAPANESE AND TAIWANESE ELECTRONICS FIRMS**
David W. Edgington and Roger Hayter
University of British Columbia and Simon Fraser University

SESSION 4E: GEOGRAPHIES OF FOOD(BLUSSON HALL 10021)

15:00-15:20 **HUNGRY IN BC: WHAT THE INDICATORS AND THE CANADIAN COMMUNITY HEALTH SURVEY (CCHS) TELL US**
Aleshia Biggs and Aleck Ostry
University of Victoria

15:20-15:40 **VANCOUVER: A URBAN HABITAT FOR FARMING**
Sharla Stolhandske
Simon Fraser University

15:40-16:00 **INTENSIVE URBAN POLYCULTURE AGROFORESTRY ON VANCOUVER ISLAND**
Christine LoScerbo, Michael Tripp
Vancouver Island University

16:00-16:20 **THE SOCIO-ENVIRONMENTAL IMPACTS OF THE SUGARCANE-ETHANOL INDUSTRY IN THE PONTAL DO PARANAPANEMA (SP): AGRARIAN REFORM, FOOD SOVEREIGNTY AND THE MST**
Liz Clements

SESSION 4F: ECOSYSTEM & LAND USE MANAGEMENT (BLUSSON HALL 10011)

15:00-15:20 **BORDERS, BARRIERS, AND BREAKTHROUGHS IN CASCADIA'S WILDLIFE COMMONS**
Troy D. Abel, Jenni Pelc, Lauren Miller, Jacqueline Quarre, and Kathryn Mork
Western Washington University

15:20-15:40 **INDICATORS OF SUSTAINABLE FOREST MANAGEMENT IN THE GREAT LAKES – ST. LAWRENCE FOREST REGION – A NATIONALLY REPLICABLE SELECTION METHODOLOGY**
Mark Hart, Peter Bush and Christian Malouin
Canadian Forest Service, Natural Resources Canada; Protected Areas Branch, Nova Scotia Enviornment; Canadian Wildlife Service, Environment Canada

15:40-16:00 **HABITAT MAPPING OF A PROPOSED MARINE PROTECTED AREA**
Rachel Elliott
University of Victoria

SESSION 4G: BIO-ECONOMIES & BIOGEOGRAPHIES (BLUSSON HALL 10031)

15:00-15:20 **THE SCIENCE OF GRIZZLY BEAR POLITICS: AN ENVIRONMENTAL ASSESSMENT CASE STUDY**
Cameron Owens
Simon Fraser University

15:20-15:40 **ENVIRONMENTALIST OR HUMANITARIAN?**
Ginny McLane and Dr Pamela Shaw
Vancouver Island University

15:40-16:00 **BIO-ECONOMIC PRODUCTIONS OF VALUE AND NATURE**
Rosemary Collard and Jessica Dempsey
University of British Columbia

POSTER SESSIONS

Poster Session - 8:15-12:15

SPATIAL MODELING TO ASSIST IN PATIENT EVACUATION DURING MASS CASUALTY SITUATIONS

Ofer Amram and Nadine Schuurman
Simon Fraser University

"PEASE BE WITH YOU" IN COMMUNITY GARDENS

Corin Boersma, Alyssa Wesselson, Caitlin Beaton
The Kings University College

LIMITATIONS AND POTENTIAL OF THE COMMODITY CHAIN AS A TOOL FOR UNDERSTANDING THE LANDSCAPES OF DEVELOPMENT GEOGRAPHY

Sean Bohle, Melanie Lichak, Kevin Whitmarsh, Chakanaka Zinyemba, Helaina Zyp, Kim Naqvi
University of Alberta

GEOGRAPHY OF FATHERHOOD IN EDMONTON: WHERE ARE EXPECTANT AND PARENTING YOUNG FATHERS?

Cameron Edney and Julie Paquette
Terra Centre for Pregnant & Parenting Teens

A DIFFERENT TAKE ON FOOD

Ian Faulds and Hans Howard
Western Washington University

GEOGRAPHY IN SCHOOLS (GIS)

Amy Ganton, Rosaline Canessa, Peter Keller
University of Victoria

HOW MODERNISM AND NEW URBANIST VIEWS HAVE HELPED SHAPE MARSHALLING YARDS AND RAIL-WAY SPACES IN NORTH AMERICAN CITIES

Lise Gibbons
University of Victoria

THE SPATIAL GEOGRAPHY OF TOTEM POLES: MARKERS OF LAND AND PEOPLE

Amanda Hein
University of the Fraser Valley

MENTAL MAPS OF TOURISM IN VIETNAM

Keith Iverson
Western Washington University

THE GEOGRAPHY OF RESIDENTIAL SCHOOLS; WITHIN BRITISH COLUMBIA

Nicole Joseph
University of the Fraser Valley

AT HOME: HABITATS OF POLICY CHANGE

Joseph Lent
University of British Columbia

THE VALUE OF FOCUS GROUPS IN QUALITATIVE RESEARCH

Teresa Looy and Jeremiah Basuric
The Kings University College

FOOD OR HOUSING? : AGRICULTURAL DEPLETION FROM A LOCAL PERSPECTIVE

Teri McCausland
The Kings University College

TRANS-BOUNDARY BIODIVERSITY GOVERNANCE IN COSTA RICA AND PANAMA'S LA AMISTAD PARK

Lauren Miller and Troy Abel
Western Washington University

CANMORE AND BANFF CEMETERIES: A NECROETHNIC STUDY

Anne-Marie Paquette
University of the Fraser Valley

RENOVATION PROFITABILITY: AN ANALYSIS OF BUILDING PERMITS AND PROPERTY VALUES IN OAK BAY

Tye Shutty
University of Victoria

FIREARMS: A CROSS BORDER STUDY OF LAWS AND REGULATIONS

Alexander Smalldon and Owen Whitcomb
Western Washington University

UNIVERSITY OF THE FRASER VALLEY U-PASS PROGRAM: SUCCESS OR FAILURE?

Kees A. Vanleeuwen
University of the Fraser Valley

Poster Session 2 - 12:45-16:45

FOREST INFERNO: IS THE USE OF FIRE IN FORESTS ECOLOGICALLY CRIPPLING OR CRUCIAL?

Denyse Dawe
The King's University College

VARIABILITY AND SOURCES OF DISSOLVED INORGANIC CARBON IN THE FRASER RIVER, B.C. CANADA

Downey
University of the Fraser Valley

SPATIAL VARIATION OF DISSOLVED AND PARTICULATE ORGANIC CARBON CONCENTRATIONS ALONG THE FRASER RIVER, BRITISH COLUMBIA

Jenna Fanslau, Bryce Downey, Steven marsh, Sharon Gillies, Alida Janmaat, Bernhard Peucker-Ehrenbrink, Britta Voss, Ekaterina Bulygina, Gregory Fiske, Timothy Eglinton, Daniel Montluçon, Helena Fraser, Garrett Macklam-Harron, Brayden Wiebe, Michelle Martinec, Carl Johnson, Scot Birdwhistell

University of the Fraser Valley

COMPARING SPATIAL ANALYSIS METHODS OF FIRST NATIONS AND RECREATIONAL ACCESS CLOSURES ON THE COMMERCIAL DUNGENESS CRAB (CANCER MAGISTER) FISHERY IN BRITISH COLUMBIA

Amy Ganton, Dr. Rosaline Canessa, Dr. Peter Keller
University of Victoria

SPATIOTEMPORAL BEHAVIOUR OF RAINFALL OVER A 20 KM2 AREA OF THE THOMPSON-BONAPARTE PLATEAU, BRITISH COLUMBIA

Jennifer L. Golden (Thompson Rivers University) and Darryl E. Carlyle-Moses (Thompson Rivers University)

Is VEGETATION RESPONSE TO WATERSHED DISTURBANCE RECORDED IN THE PALYNOLOGICAL RECORD OF LOWLAND WETLAND SEDIMENTS?

Emily Helmer and Jonathan Hughes
University of the Fraser Valley

QUANTIFYING FLOW RESISTANCE DUE TO CLUSTERS IN GRAVEL-BED RIVERS

Megan L. Hendershot and Jeremy G. Venditti
Simon Fraser University

THE BOREAL FOREST UNDER IPCC CLIMATE WARMING

Tyler Herrington and Dr. Owen Hertzman
Simon Fraser University

OPTICAL DATING STUDIES OF LAVA-BAKED GLACIOFLUVIAL SEDIMENTS, WELLS GRAY VOLCANIC FIELD, BRITISH COLUMBIA

Daniel Huesken, Justine Cullen, and Olav B. Lian
University of the Fraser Valley

MERCURY METHYLATION AND SULPHUR-REDUCING BACTERIA IN SUB-ARCTIC LAKE SEDIMENTS

Jocelyn A.Joe-Strack ad Ellen L. Petticrew
Univeristy of Northern British Columbia

SPANISH BANK CREEK RESTORATION PROJECT: A CRITICAL ECOLOGICAL EXPLORATION INTO IT'S PROGRESS AND GOVERNMENT-COMMUNITY ENVIRONMENTAL INITIATIVES

Daniel Lai, Corey Anne Campbell, Cheryl Tam, Laura Pfister, Amna Rathore, Owni Toma, Timothy Wong
University of British Columbia

BEDFORM GEOMETRY AND MIGRATION UNDER BEDLOAD-, MIXED- AND SUSPENDED- DOMINATED TRANSPORT STAGES

Martin Lin and Dr. Jeremy G. Venditti
Simon Fraser University

REVEALING THE URBAN GAZE: 3D VIEWSHEDS FOR GEOVISUAL ANALYTICS

Chris Lonergan and Dr. Nick Headley
Simon Fraser University

MCNULTY'S AMERICA DEL SUR-VERANO 2010

Cheymus McNulty
Vancouver Island University

PLANT-POLLINATOR INTERACTIONS AS ALEXANDRA FIORD, NUNAVUT

Samuel V. J. Robinson and Greg H. R. Henry
University of British Columbia

DENDROCHRONOLOGICAL RECONSTRUCTION OF RECENT FIRE EVENTS NEAR BURNELL LAKE IN THE SOUTHERN OKANAGAN, BRITISH COLUMBIA

Alanna Schuurmans and Jonathan Hughes
University of the Fraser Valley

BLOOMING PROBLEMS: THE ROLE OF POLICY AND ENFORCEMENT IN THE ALGAE CRISIS AT PIGEON LAKE

Ben Thomsen and Chelsea Dyck
The Kings University College

CARBON AND NITROGEN FLUX IN INTERTIDAL WETLANDS AT THE HEAD OF RIVERS INLET, BRITISH COLUMBIA, CANADA

Lee van Ardenne and Jonathan Hughes
University of the Fraser Valley

SEASONAL STORAGE AND RETENTION OF MARINE-DERIVED NUTRIENTS IN THE HYPORHEIC ZONE OF THE HORSEFLY RIVER, BRITISH COLUMBIA

Leah M. Vanden Busch, Ellen L. Petticrew, & John F. Rex
University of Northern British Columbia

ABSTRACTS

(ARRANGED BY LAST NAME OF PRIMARY AUTHOR)

BORDERS, BARRIERS, AND BREAKTHROUGHS IN CASCADIA'S WILDLIFE COMMONS

Troy D. Abel, Jenni Pelc, Lauren Miller, Jacqueline Quarre, and Kathryn Mork

This paper focuses on the "new" politics and policy of ecosystem management through a case study of wildlife conservation and management efforts in the transboundary Cascades region. We are a group of environmental geographers exploring the evolving opportunities and barriers to regional wildlife conservation in the Greater North Cascades Ecosystem. Our research combined content analysis of policy documents and semi-structured stakeholder interviews and questionnaires. We also produced a series of maps and GIS data layers that provide useful spatial information about the wildlife commons in the Cascadia region. The results of the content analysis and surveys present a picture of uneven management, fragmentation on both sides of the border and because of it, very few efforts in civic ecosystem management. In short, the Cascadia wildlife corridor needs some CPR, or the resource, institutional, and stakeholder characteristics that have been identified as essential to the successful management of Common Pool Resources (CPR). Our research leads to several policy prescriptions including: (1) communication efforts that begin to establish a geographic identity for the Cascadia Wildlife corridor; (2) participatory efforts that foster civic environmentalism; and (3) institutional governance building at multiple scales.

COMPARING 'SUSTAINABLE' COMMUNITIES: SOUTHEAST FALSE CREEK AND DOCKSIDE GREEN"

Don Alexander and Christine Krumrey
Vancouver Island University

Vancouver's Southeast False Creek/ Olympic Village and Victoria's Dockside Green have been touted as being amongst North America's most sustainable communities. Despite differences – for instance, Dockside Green's agenda was driven by the developer, whereas planners and activists drove the green agenda in Southeast False Creek – both have considerable achievements to their credit.

However, sustainable urban development is about more than 'bricks and mortar' and the bells and whistles of green roofs or alternative energy systems. It is about habitat for diversity – for people and flora and fauna – and it is about how the built environment facilitates a sense of place, a connection amongst community members, as well as encouraging people to act responsibly.

Dockside Green and Southeast False Creek may perform well in terms of reducing their respective urban footprints, but how well do they communicate a message of sustainability? Let us take a look at their architecture and landscaping and at the interface between nature and the built environment. What is the quality of public and semi-public spaces? Is there a chance for citizens to assemble formally and informally?

Using photos and text, this presentation will explore the similarities and differences of these two neighbourhoods in light of these criteria. As new greener neighbourhoods come on-stream, it is important to understand how well they are succeeding in serving as habitats for diversity and as a seed for a new sustainable society.

SPATIAL MODELING TO ASSIST IN PATIENT EVACUATION DURING MASS CASUALTY SITUATIONS

Ofer Amram and Nadine Schuurman

The survival or recovery of persons critically injured in incidents involving mass casualties is directly related to their access to timely and appropriate treatment. The management of mass casualty evacuation priorities has been underexplored from a spatial perspective. To mitigate this absence and enable more informed decision making, a web based spatial decision support system (SDSS) has been developed. The proposed model uses pre calculated driving times to analyze the driving time to each hospital within the metro Vancouver region of British Columbia. Using a geographic information system, the model incorporates hospital capacity in addition to injury type and severity as the basis for decisions about the facility to which each patient should be sent. It also enables hospital personnel to update hospital capacity in real time while producing results in a matter of seconds, as is required within an MCI situation. The analysis and visualization associated with the model incorporates spatial network analysis as well as specialized algorithms for calculating travel times. Modeling complex evacuation priorities using a geographic information system enables the examination of different scenarios in multiple mass casualty circumstances at varying locations. This tool will potentially assist emergency service personnel to optimize decision-making processes during critical stages of evacuation.

THE DIRECTIONAL BEHAVIOUR OF CRIMINALS IN DIFFERENT URBAN FORMS
Martin A. Andresen, Richard Frank, and Patricia L. Brantingham

Simon Fraser University Spatial criminology has three interrelated elements: place, distance, and direction. Though directionality has had theoretical support for many years, very few empirical verifications of this component of crime have emerged. In this paper, we investigate the strength of directionality by comparing a simulated randomized dataset and a large incident-based dataset of repeat offenders in multiple municipalities that have different urban forms. We find strong evidence for directional bias in criminal spatial decision-making. Moreover, the strength of this bias has a geography.

PROGRESS TOWARDS ACOUSTIC SUSPENDED SEDIMENT TRANSPORT MONITORING: FRASER RIVER, BC
Maureen Attard, Jeremy Venditti, Michael Church
Simon Fraser University

The sediment budget of the Lower Fraser River provides a long-term perspective of the net changes in channels and in sediment delivery to Fraser Delta. The budget is based on historical sediment rating curves developed from data collected between 1965 and 1986 by the Water Survey of Canada. Dredging of navigation channels is altering the sediment rating curves. Here we explore the possibility re-establishing the sediment monitoring program using hydro-acoustics. We evaluate the use of a 300 kHz side-looking acoustic Doppler current profiler (ADCP), mounted just downstream of the sand-gravel transition at Mission, for continuous measurement of suspended sediment transport. This is accomplished by correlation of acoustic backscatter and acoustic attenuation with water-sediment samples collected using conventional bottle sampling methods with a P63-sampler. These calibrated signals will be used to examine the 2010 sedigraph by calculating daily and annual sediment flux into the Fraser Estuary and to the delta front. The research will provide a methodology that is continuous, precise, and replaces the need for traditional labour intensive sampling techniques.

DIGGING IN THE SAND: EXPLORING THE CONFLICT BETWEEN INDIGENOUS RIGHTS AND BIODIVERSITY CONSERVATION THROUGH ABORIGINAL CLAM GARDENS
Skye Augustine and Phil Dearden
University of Victoria

This paper explores the tension between indigenous cultural preservation and biodiversity conservation. First Nations along the Pacific Northwest coast built clam gardens to augment the natural productivity of sites to produce clams. Reintroducing clam gardens could provide local First Nations access to traditional resources and aid in the preservation of threatened cultural practices. National parks now exist on the traditional territory of nations who have traditionally used clam gardens. The presence of clam gardens within parks presents the opportunity for the reintroduction of this practice.

Yet these cultural benefits come at a cost. Biodiversity is the single most threatened earth-system essential to the maintenance of life-providing ecosystems. Canada's national parks have been established to preserve biodiversity, and are managed with the prime mandate of maintaining ecological integrity. Clam gardens alter the structure of the intertidal region, and will change natural ecological processes. This draws into question the validity of reestablishing essentially an agricultural practice into a national park.

CONTROLS ON SEDIMENT PRODUCTION FROM FOREST ROADS IN A PACIFIC MARITIME WATERSHED
Elizabeth Baird and Ilja Tromp-van Meerveld
Simon Fraser University

Forest roads can be a significant source of sediment to nearby streams. Increased sediment concentrations can negatively impact aquatic ecology and water quality, including drinking water quality. The Honna River, Haida Gwaii, British Columbia, has recently been developed as a drinking water source for the Village of Queen Charlotte. Village officials are therefore looking for a better understanding of the controls on sediment production from forest roads within the Honna watershed. However, we still do not understand sediment production from forest roads in unstudied watersheds because current datasets, literature and models addressing road hydrology are restricted to a few study sites.
Twenty four large scale rainfall simulation experiments were completed on the Queen Charlotte Mainline South forest road to determine the influence of road use intensity, rainfall intensity, amount and duration on the amount of sediment generated from the road surface. Trials were conducted for three different precipitation intensities, with and without traffic from logging trucks, and with various antecedent precipitation and road use conditions. Precipitation intensity was the dominant control on the amount of sediment produced from a road section. Antecedent precipitation conditions were not important. Generally only a small fraction

(<30%) of the total mass of sediment produced during a precipitation event was directly caused by traffic. The amount of sediment produced by a road section varied spatially showing caution must be used when extrapolating relationships derived from one road section to another, even within the same watershed.

SPATIAL DISAGGREGATION OF THE UNIVERSAL SOIL LOSS EQUATION USING A CELLULAR AUTOMATA APPROACH

Laurens Bakker, Brandon Heung, Suzana Dragićević, Margaret G. Schmidt
Simon Fraser University

Cellular automata (CA) are part of a suite of models that handle spatio-temporal components of dynamic phenomena. CA are appropriate for modeling physical phenomena because they both act at small scales but result in patterns at larger scales. Often, large-scale patterns are directly fitted with a statistical model, such as the Universal Soil Loss Equation (USLE). To obtain a better resolution for the USLE (which operates at the slope level), a spatially disaggregated CA model was developed, using the components of the USLE. Rainfall erosivity; vegetation cover derived from satellite imagery; and slope characteristics were incorporated into the model. In addition, soil depth and soil erodibility attributes derived from polygon soil data (digitized from existing soil survey maps) were included. The developed model was tested on Bowen Island, British Columbia, Canada where soil redistribution predictions were made for 100 years. Soil depth change ranged from a 3cm loss to a 23cm accumulation with greatest loss on hilltops, and greatest accumulations in convergent areas. Proof of quantitative equivalence to the USLE, incorporation of spatially-explicit soil attribute data (soil texture, depth, erodibility, and bulk density), and an assessment of the impact of neighbourhood size are areas for future research. This model has the potential to assist in long-term habitat, ecological, and resource management as well as contribute to digital soil mapping.

INFILL AS AN ALTERNATE TO GREENFIELD DEVELOPMENT: BARRIERS AND BENEFITS

Steven Beasley
University of Victoria

Increasing public discourse on the impacts of climate change and environmental degradation have led to a major examination of the common patterns of urban and suburban development in our towns, cities and metropolitan regions. Urban reform movements have proposed a series of design tools and planning principles to provide options for more sustainable growth. Infill development is one key strategy promoted by several such movements to reduce the outward expansion of urban spaces. Loosely defined as new development in existing urban areas, infill development has well documented environmental, social and economic benefits; however, a series of barriers limit its use. When compared to conventional greenfield development, infill projects face a series of political and economic challenges that increase cost to developers, thus limiting the marketability of infill projects. Though significant literature exists on the benefits and barriers of infill development, existing scholarship draws on examples from central city neighborhoods of large metropolitan cities in the United States. To address suburban sprawl in Canada, a better understanding of the challenges and advantages of implementing infill development in smaller, Canadian cities and towns is needed.

HUNGRY IN BC: WHAT THE INDICATORS AND THE CANADIAN COMMUNITY HEALTH SURVEY (CCHS) TELL US

Aleshia Biggs and Aleck Ostry
University of Victoria

The importance of food as a prerequisite for life is obvious to most, but the implications of food go beyond just one's physical need for it. The act of preparing a meal signifies one's ability to provide nourishment and empowers an individual's independence. When food becomes scarce or difficult to obtain, then the ability to provide nourishment and empowerment also diminishes. The Canadian Community Health Survey (CCHS) excludes certain groups from their surveys that are known to be highly vulnerable for food insecurity. Equally important though, is the understanding that one sole indicator does not cause food insecurity, rather the presence and combination of more than one increases an individuals susceptibility to situations of food insecurity. Therefore, a multivariable indicator was developed to symbolize a region's vulnerability towards food insecurity based on the severity and presence of one or more variables. It was created by indexing a ranking scheme for the indicators based on their severity and linkage to food insecurity. The multi-variable indicator was then used to map vulnerability in BC's sixteen Health Service Delivery Areas. The indexed maps produced interesting contrasts from the survey data. Some regions agreed with the survey data and others, such as the Northern Interior, showed a complete contrast to the survey's results. The maps point out that the exclusion of groups from surveys when those groups are known to be significantly vulnerable for health issues can produces vastly different results.

TOWARDS A SOCIO-SPATIAL FRAMEWORK FOR UNDERSTANDING PHYSICAL BARRIERS TO SERVICES AND AMENTIES FOR PEOPLE WITH MOBILITY ISSUES

Jessica Blewett and Dr. Neil Hanlon
University of Northern British Columbia

Geographic Information Systems (G.I.S.) techniques are useful in mapping barriers to physical access and yet these techniques rarely include the lived experiences and perspectives of individuals with mobility issues themselves. In this presentation I will present a framework for my master's thesis research which will employ critical theoretical perspectives to enhance an understanding of disability in a geography specific context. I will outline steps to construct a G.I.S. database that includes information on spatial barriers to services, amenities and mobility in my study area, the City of Prince George B.C. I will next describe my plans to collect qualitative information from persons with mobility issues to add greater depth to understanding the lived experience of physical barriers. By completing this research, my intention is to gain valuable insight into the challenges facing persons with mobility issues and provide municipal planners and policy makers with tools to improve and enhance mobility in the local built environment.

"PEAS BE WITH YOU" IN COMMUNITY GARDENS

Corin Boersma, Alyssa Wesselson, Caitlin Beaton
The Kings University College

Community gardens support local food production, strengthen food security, enhance community life and increase environmental stewardship. Additionally community gardens can promote community development among those living in poverty. This poster details the implementation of a community garden in downtown Edmonton in the summer of 2010 by The Mustard Seed, a humanitarian organization committed to building healthy community to address the issue of poverty in the Greater Edmonton area. The "Peas Be With You Garden" was placed in a vacant plot located in the community of McCauley, a neighborhood where many residents live below the poverty line and lack access to essential resources. The garden was a tremendous success and generated a positive atmosphere where residents could build relationships, a sense of purpose and self-esteem while producing their own food. It also helped revitalize the struggling neighborhood of McCauley by creating a beautiful green space in a previously unattractive vacant lot. Based on geographic literature, these benefits are consistent with other community gardens that have helped individuals living in poverty by increasing their capabilities through the development of new skill sets, providing affordable fresh food and creating green space in urban areas. This tool for community development also presents an opportunity for environmental connection and education. Community gardens can be aesthetically pleasing sources of hope, health, and life in struggling communities.

LIMITATIONS AND POTENTIAL OF THE COMMODITY CHAIN AS A TOOL FOR UNDERSTANDING THE LANDSCAPES OF DEVELOPMENT GEOGRAPHY

Sean Bohle, Melanie Lichak, Kevin Whitmarsh, Chakanaka Zinyemba, Helaina Zyp, and Kim Naqvi
University of Alberta

The commodity chain is a well established analytical tool for investigating labour, production, and value added patterns for a commodity. Its focus, however, is primarily on the patterns and logistics of backward and forward linkages between economic activities in their institutional context. While diverse and enlightening for studying patterns of economic and social change, the commodity chain does not include the broader range of issues which have become central to post-structural approaches in development geography. In particular, the commodity chain does not theorise and pays little or no attention to material outputs and their ecosystem context. It also does not engage with many dimensions of place, culture, and social identity and relationships which also underlie economic production and mainstream and alternative development practice. This work examines commodity chains in the context of post-structural development thought in order to identify more complex relationships underlying nodes of transformation, linkages, and institutional contexts of production.

MEASURING THE CARBON SEQUESTRATION POTENTIAL OF EXTENSIVE GREEN ROOFS – PART 1: A COMPARATIVE PLANT PHYSIOLOGY EXPERIMENT

Keri Bowering
Vancouver Island University

Vegetated or "green" roofs attempt to solve a variety of environmental issues presented in urban settings. While some of these beneficial allegations are scientifically tried-and-true, such as the mitigation of urban heat island effect, improvement of storm water management and energy conservation, other claims have yet to be scientifically investigated. Among these is the carbon

sequestration potential of a green roof system. It is often assumed that vegetation on roofs can significantly restore the carbon balance of a building through the assimilation of carbon dioxide (CO2) during photosynthesis; however, this assumption has neither been thoroughly tested nor quantified in a green roof context. Analyzing the physiology of plants commonly used on extensive green roof systems in this region may help in the development of a model which can predict the carbon sequestration potential of a given vegetated area under certain environmental conditions. As a first step, the diurnal net CO¬2 assimilation patterns of three Vancouver Island native Sedum species- oreganum, spathulifolium and divergens- are currently being studied under well-watered and drought-stressed conditions. The findings to date will help uncover the metabolic processes utilized by each of the three native species and will aid in the evaluation of green roofs as potentially significant carbon sinks in urban environments.

TWENTIETH CENTURY GLACIER CHANGE AND SURFACE RUNOFF MODELING, CANOE BASIN, B.C.

Teresa Brewis and Brian Menounos
University of Northern British Columbia

The Columbia River is a vital freshwater resource in British Columbia and the Pacific Northwest. Runoff from snow and glaciers represent important sources of water, but the total contribution of glaciers to streamflow in the Columbia Basin remains uncertain. We quantify area and volume loss of glaciers in the Canoe Basin, a 300 km2 headwater basin of the Columbia River, since 1955, and examine the impacts of glacier and climate change on streamflow. Using digital photogrammetry, we extracted glacier extents from five decades of air photos (1955, 1970, 1985, 1996 and 2005), and collected mass points on a 100 m grid to estimate volume change. Many glaciers in the Canoe Basin advanced from 1955 to 1985 and then retreated. One glacier complex in the watershed showed continuous retreat from 1955 to 2005.
Our next step is to use the HBV-EC semi-distributed conceptual hydrologic model to simulate streamflow and glacier melt in the Canoe River. We will calibrate the model using the Water Survey of Canada streamflow record and the change in glacier volume extracted from air photos. The reconstructed streamflow record will be analyzed in comparison to climate and glacier change, to determine how these factors affect the timing and quantity of runoff. The model will also be forced with various emission scenarios for the 21st century to estimate future changes in surface runoff in the Canoe Basin.

QUANTIFYING FRESHWATER ICE ACROSS THE NORTHERN HEMISPHERE USING GIS AND A DEGREE-DAY ICE GROWTH MODEL

Rheannon N. Brooks, Terry D. Prowse and Ian J. O'Connell
University of Victoria

The cryosphere integrates climate variations over a wide temporal scale through direct connection to the surface energy budget, the water cycle, and surface gas exchange (Lemke et al., 2007), and freshwater ice, defined as river and lake ice, makes up one of the eight main components of the cryosphere (Fitzharris, 1995). Therefore, variations in climate are reflected in the variations of freshwater ice. Furthermore, freshwater ice cover plays an important role in the biological, chemical, hydrologic, and geomorphological functions of freshwater ecosystems (Prowse, 2001a, b).
Although the distribution of freshwater ice has been examined at the small scale, a comprehensive quantification, including the geographic scope and volume in the Northern Hemisphere (NH), is absent in the literature. This work presents an effective GIS-based approach to address this shortcoming, by examining the large-scale spatial and temporal variability of freshwater ice. Michel's degree-day ice-growth model (1971), which relies on accumulated freezing degree-days derived from surface air temperature, is used to calculate peak-ice thickness across the NH. Observed peak-ice thickness measurements for both rivers and lakes are used to calibrate and validate the model. Hydro-climatic regions in the NH are defined and assigned coefficients to validate the model using observed peak-ice thickness data. The model is then used to quantify freshwater ice across the NH. At present, the ice thickness datasets exclude large lakes, as large lakes allow for more heat storage over the winter when compared to smaller lakes, and require a different approach to modelling. Future research will examine this concern.

TURBULENT AIRFLOW AND SEDIMENT TRANSPORT OVER A VEGETATED FORDUNE, PEI NATIONAL PARK, CANADA

Connie Chapman, Ian J. Walker
University of Victoria

This study examines the response of turbulent airflow over a vegetated foredune from ultrasonic anemometers located at several locations from the upper beach to dune crest at Greenwich Dunes, PEI, National Park. Saltation intensities were measured by high-frequency laser particles counters co-located with 3-d sonic anemometers at 20 cm above the surface to characterize coarse resolution (1Hz) turbulent airflow behaviour and related stresses. The data were collected on 3-4 May 2010 during a mid-latitude cyclone event that generated offshore winds that shifted to strong alongshore winds then diminished to oblique onshore winds with wind speeds increasing from approximately 6 to >15 m s-1. This paper describes the frequencies of quasi-instantaneous quadrant

(Q) events including outward interactions (Q1: u'>0, w'>0), ejections (Q2: u'<0, w'>0), inward interactions (Q3: u'<0, w'<0), and sweeps (Q4: u'>0, w'<0) for their roles in generating Reynolds stresses over the dune. Flow exuberance (Q1+Q3/Q2+Q4), a measure of the contribution of ejections and sweeps to near-surface stress generation, and Reynolds stresses are correlated to observed saltation intensity counts for a subset of runs to explore relations between the ejection-sweep phenomenon and sand transport over foredunes. Turbulent flow characteristics (turbulence intensity, total kinetic energy), Reynolds stresses, and corresponding quadrant event (u', w') distributions to changes in incident flow direction and speed will be examined and explore. A more detailed examination of sand flux and transport intensity trends are provided in a companion paper.

THE INS AND OUTS OF BURNS BOG: A LOOK INTO THE WATER BALANCE OF A LARGE OMBROTROPHIC BOG IN THE FRASER VALLEY

Yue-Ching Cheng and Ilja Tromp-van Meerveld
Simon Fraser University

The hydrology and water balance of Burns bog, a 3000 ha raised bog located between the south arm of the Fraser River and Boundary Bay has been altered by drainage, peat harvesting and lagg destruction, resulting in forest encroachment along the borders of the bog. In order to assess the impacts of forest encroachment on the bog, a water balance study was undertaken in 2009-2010 in a pristine area of the bog and a nearby area that is affected by forest encroachment. All inputs, outputs and changes in storage were either directly measured or calculated. Precipitation and throughfall were measured with rain gauges. Evaporation and transpiration were measured with lysimeters and constant heat sapflow sensors. Peat moisture content, surface level, water levels, and ditch water levels were measured as well. Drainage into the silts underneath the peat was estimated from hydraulic head and hydraulic conductivity measurements. Lateral flow and overland flow were calculated from the water balance residuals. In this presentation, we will discuss the water balance of Burns bog and highlight the differences in the water balance of the pristine bog site and the forested site. Understanding the differences in the water balance of both sites will help understand the effects of forest encroachment on the hydrology of the bog and therefore the effectiveness of bog restoration efforts.

ENABLING PUBLIC HEALTH SURVEILLANCE IN LOW AND MIDDLE-INCOME COUNTRIES: THE ROLE OF WEB 2.0 AND GEOWEB TECHNOLOGIES

Jonathan Cinnamon and Nadine Schuurman
Simon Fraser University

More than 90% of injury-related deaths occur in low and middle-income countries (LMIC). Injury surveillance – the collection, analysis and interpretation of data concerning injury in populations – is rare in LMIC, thus, little is known about its causes, the spatial context, or the populations at risk. Two major barriers to surveillance are access to software and trained personnel. Free and easy-to-use Web technologies may facilitate the removal of these barriers.
A pilot study was conducted in Cape Town, South Africa to assess the feasibility of using Web 2.0 and Geospatial Web tools for injury surveillance, as a substitute for more costly and sophisticated licensed software. Epidemiological data were collected and visualized at a major hospital's trauma unit using lightweight Web applications.
Simple and streamlined data entry and management was implemented in GoogleDocs. The ability for anyone to access or edit this dataset from any Web-enabled computer at anytime was a particular enabler in this context. Data georeferencing was undertaken using free Web-based geocoding tools, which provided reasonable accuracy at the neighbourhood level. Google Earth provided a familiar and easy to navigate platform for mapping and visual analysis of injury locations in Cape Town.
The findings of the study suggest that Web 2.0 and GeoWeb applications can facilitate streamlined data collection, management, and visual analysis. This presents an opportunity for hospitals with constrained resources to engage in injury surveillance. Overall, this exploratory study presents a step towards the development of trauma registries that are appropriate for low-resource hospitals.

THE SOCIO-ENVIRONMENTAL IMPACTS OF THE SUGARCANE-ETHANOL INDUSTRY IN THE PONTAL DO PARANAPANEMA (SP): AGRARIAN REFORM, FOOD SOVEREIGNTY AND THE MST

Liz Clements
Vancouver Island University

Abstract: In Brazil, the expansion of sugarcane for ethanol production is fundamentally altering the rural landscape and represents a significant change in the trajectory of the country's rural development and agrarian reform policies. Current policies are highly skewed in favour of agrofuel industries and are denying landless rural workers and peasant families, like those of Brazil's Landless Workers Movement (MST), access to land. This paper elucidates the socio-environmental impacts of the burgeoning sugarcane-

ethanol industry in the Pontal do Paranapanema, a region in the extreme west of the São Paulo state with a long history of land-related conflicts. While corporations reap astronomical profits from a corporate controlled national and growing global agrofuel industry, the costs of agrofuel expansion in the Pontal do Paranapanema and in Brazil have been disproportionally borne by the environment and the most impoverished and marginalized members of society. The territorialization of the sugarcane-ethanol industry in the Pontal do Paranapanema, as with the rest of Brazil, only further concentrates control of land and economic and political power. The industry`s rapid territorial advancement comes at the direct expense of small-scale farmers and the landless, ecological agriculture, or agroecology, and, ultimately, local food security and sovereignty.

USING MARXAN TO INCLUDE COMMUNITY SOCIO-ECONOMIC VALUES IN CONSERVATION PLANNING

Heather M. Coleman, Pacific Marine Analysis and Research Association and Dave Nicolson, BC Marine Conservation Analysis

Marxan conservation planning software (hosted by the University ofQueensland) is designed to support land and marine use planning,particularly the creation of a reserve network. Using Marxan, planners canidentify an efficient system of conservation sites that includes a suite of biodiversity targets at a minimal cost. However, how “cost” is defined and applied has a significant influence of the efficiency and “implementability” of a reserve network. One component of cost that Marxan considers is based on planning units, which can include planning unit size, land purchase costs, impacts on the landscape, or conflicting uses. It is well known that these factors are not uniform across a landscape, and furthermore, conflicts may arise when combining socio-economic costs into one layer. Recently, innovative developments have offered new ways of incorporating these data into a Marxan analysis. This presentation will provide an overview, advantages, and disadvantages of potential techniques including: the use of surrogates, opportunity cost, foregone effort, existing human impact measurements, planned actions such as acquisition and stewardship, multiple cost surfaces (run separately), and conducting separate analyses with biodiversity and socio-economic features as respective targets and “costs”.

BIO-ECONOMIC PRODUCTIONS OF VALUE AND NATURE

Rosemary Collard and Jessica Dempsey
University of British Columbia

At the 10th Conference of Parties to the Convention on Biological Diversity, the ‘Bolivarian Alliance for the Peoples of Our America’ (ALBA) countries pressed for the recognition of the Rights of Mother Earth, and forcefully argued, over and over again, against the “commodification of life”, in their words. Delegates from other countries responded with perplexed faces, unsure what exactly this meant. “Do people in your country keep bees, and collect and sell honey?” a US delegate asked the Bolivian negotiator in the heat of negotiations over ‘innovative financial mechanisms’. The representative’s question is at the heart of this paper. When we declare, ‘Life is not for sale’ – a common rallying cry by opponents to the emerging REDD and other biodiversity offsetting mechanisms – what does this mean, precisely? And how are we to understand this statement in relation to long histories of ‘selling’ life? We explore these questions by bringing together analyses of two bioeconomies that both ostensibly commodity life: trade in wildlife, and ecosystem services like carbon sequestration. Drawing from theorizations of biocapital (e.g. Sunder Rajan’s Biocapital, Melinda Cooper’s Life as Surplus, Nicole Shukin’s Animal Capital), we trace shifting boundaries between the kinds of lives that can be traded, bought and owned, and the kinds of lives that must not ‘be for sale’. In exploring the production of value through and within these two bioeconomies, and the multiple oppositions to them, we inquire into the relationship between economic and ethical value within the trade of living beings, and into the productions of nature that result.

DIGGING THE LOW DOWN - TRACKING WINTER STORMS AND THEIR SIGNATURES ON THE COLUMBIA ICEFIELD.

Selena Raven Cordeau
University of Victoria

Here in Western Canada where the land is so rich in glaciated features, understanding the relationship between weather and glacier mass balance fluxes plays a key role in water management for habitats and communities downstream. A synoptic weather classification scheme is being developed to explain the climatic processes controlling mass-balance fluctuations on the Columbia Icefield in the Canadian Rockies. This simple classification system is designed to integrate the various weather-related processes that control the ice cap mass-balance. The data from snowpits and ice cores, gathered (from a lot of digging in the snow) during field seasons, were matched to corresponding weather events of the same year.

LATE HOLOCENE GLACIER ACTIVITY IN THE MOUNT WADDINGTON AREA, CENTRAL BRITISH COLUMBIA COAST MOUNTAINS

Bethany Coulthard, Jill Harvey, Dan Smith
University of Victoria

The extent and volume of glaciers in the British Columbia Coast Mountains has fluctuated in concert with the climate shifts that characterize the Holocene epoch. Despite pioneering studies undertaken by Ryder and Thompson (1986) limited attention has been directed to detailing the Late Holocene response of glaciers in the vicinity of Mt. Waddington. This remote, high relief landscape contains some of the tallest peaks in the province and is characterized by granitic bedrock, rugged terrain, and large valley glaciers. These glaciers began receding from their LIA terminus positions early in the 20th Century and are now characterized by extensive unvegetated forefields and large lateral moraines containing the remnants of glacially-killed trees. In the summers of 2008 and 2009 dendroglaciological surveys were undertaken near the confluence of the Confederation and Franklin glaciers west of Mt Waddington, and at Jambeau Glacier south of Mt. Waddington. The findings of these investigations and a chronology of Late Holocene glacier activity in the Mt. Waddington area are reported.

DENDROGLACIOLOGICAL INVESTIGATIONS AT SOUTH MORE GLACIER, NORTHERN BRITISH COLUMBIA COAST MOUNTAINS

Jessica Craig, Dan Smith and Dave Lewis
University of Victoria

University to Victoria Tree-Ring Laboratory, Department of Geography, University of Victoria, Victoria, British Columbia V8W 3R4
South More Glacier is located in the headwaters of More Creek in the northern British Columbia Coast Mountains, between the Iskut River and Mess Creek. The glacier, which is 2 km wide and 10 km long, divides into southern (terminus 1010 m asl) and northern (terminus 1150 m asl) lobes about 5 km apart. The forefield of the southern lobe is characterized by an extensive outwash plain and residual till islands positioned inside the recently deglaciated forefield. The maximum extent of South More Glacier during the Little Ice Age is demarcated by a distinct trimline and a terminal moraine that crosses More Creek at 900 m asl. Reconnaissance surveys in July 2005 within 0.5 km downstream of the glacier snout led to the discovery of subfossil boles and stumps exposed in gullies eroded through the till islands. Dendroglaciological and radiocarbon analysis identifies the majority of the glacially-killed trees as having been entombed by an advance of South More Glacier into a standing forest around 1500 14C years BP. The discovery and dating of dendroglaciological samples to this interval documents one of the northernmost locations where the regionally-extensive First Millennial Advance has been described in the British Columbia Coast Mountains.

DETERMINING THE OPTIMAL PROTOCOL FOR OPTICAL DATING OF EOLIAN LANDFORMS IN THE FOOTHILLS OF SOUTHERN ALBERTA

Justine R. Cullen, Olav B. Lian, and Stephen A. Wolfe
University of the Fraser Valley

Eolian landforms of Holocene age in the prairie dryland regions of Saskatchewan, Manitoba and Alberta have been extensively dated using optical dating in order to establish periods of landscape stability and instability, some of which have been associated with short and long term fluctuations in climate. Previously, potassium feldspar and a multiple-aliquot technique were used exclusively to provide reliable age information. A standard protocol of the single-aliquot regenerative-dose (SAR) method has recently been tested on quartz from samples taken in the Alberta Foothills that are well constrained by many independent ages derived from tephra and radiocarbon dates on charcoal. However, these SAR optical ages significantly underestimated the independent ages. To determine an optimal optical dating protocol for the area, quartz was isolated from new samples taken above and below the tephra beds at one location. The standard SAR protocol used for dating the original quartz samples was modified by changing various measurement temperatures (i.e. the preheat, cutheat and read temperatures) to determine the best quartz protocol for quartz sediment in the region. The ages determined from these new samples, using the new measurement protocol, showed significant improvement over those acquired from the original samples.

FOREST INFERNO: IS THE USE OF FIRE IN FORESTS ECOLOGICALLY CRIPPLING OR CRUCIAL?

Dawe, Denyse
The King's University College

In the area now consisting of Cypress Hills Provincial Park, fire has traditionally been the source of major disturbance upon which healthy, ecological succession has relied. Lodgepole pine, one of the predominant species unique in this area, requires the heat of forest fires to release seeds encased by the hard resinous coating of their cones. However, since the establishment of the park, only one major fire has burned through the region. This is largely due to forest management practices which place priority upon

popular public opinion. Fire is generally viewed as a form of natural disaster by the public and burned areas are thought to be aesthetically undesirable. This, along with human use of the park for recreation and pasture, has restricted the use of prescribed burns as a management tool and encouraged fire suppression. The lack of natural disturbance has prevented ecological successive cycles from occurring, creating a relatively homogenous block of mature forest habitat. Without the selective process of fire, non-native and competitive (though less fire resilient) species have been able to invade the park. The habitat stagnates and slowly deteriorates as trees reach maturity and die. This creates perfect conditions for the outbreak of pests such as the mountain pine beetle. This poster will use the case study of how suppression of fire led to the mountain pine beetle outbreak in the forests of British Columbia to advocate for the use of prescribed burns in the Cypress Hills Provincial Park.

VARIABILITY AND SOURCES OF DISOLVED INORGANIC CARBON IN THE FRASER RIVER, B.C. CANADA

Downey, B. (University of the Fraser Valley), Fanslau, J. (University of the Fraser Valley), Marsh, S. (University of the Fraser Valley), Gillies, S. L. (University of the Fraser Valley), Janmaat, A. (University of the Fraser Valley), Peucker-Ehrenbrink, B. (Woods Hole Oceanographic Institution), Voss, B. (Woods Hole Oceanographic Institution), Wang, Z. (Woods Hole Oceanographic Institution), Hoering, K. (Woods Hole Oceanographic Institution), Eglinton, T. I. (Woods Hole Oceanographic Institution), Montluçon, D. B. (Woods Hole Oceanographic Institution), Fraser, H. (University of the Fraser Valley), Macklam-Harron, G. (University of the Fraser Valley), Wiebe, B. (University of the Fraser Valley), Martinec, M. (University of the Fraser Valley), Johnson, C. (Woods Hole Oceanographic Institution), Birdwhistell, S. (Woods Hole Oceanographic Institution)

As global temperatures rise the understanding of carbon sequestration and its mechanism, and rate of transport from land to the atmosphere becomes progressively more important. Inorganic carbon is a large source of atmospheric carbon. By studying the rate at which it is released from different locations and materials, it is possible to estimate the rate at which carbon will be released as global temperatures change. A major component of the global carbon cycle is the transport of sequestered carbon to the ocean via rivers, where outgassing into the atmosphere can occur; the study and quantification this process lead to the formation of the World River Group (WRG). One river that is being studied by the WRG, is the Fraser River in B.C., although smaller than the other rivers being studied, it provides valuable information as it contains a wide range of terrains and inorganic carbon sources. During the summer of 2009 dissolved inorganic carbon (DIC) concentrations were collected from several locations along the Fraser River. This data was then associated to their individual watersheds and tributaries via GIS, to determine high and low source areas of DIC. The DIC concentrations from the various sampling locations ranged from 295.5 - 1633.3 (µmol/kg). By identifying these sources and studying them, it is possible to estimate how much DIC would be released if river beds shifted or water levels changed and impacted different geologic features.

BALANCING CONSERVATION WITH RURAL LIVELIHOODS, POVERTY AND FOOD SECURITY IN TANZANIA

Bruce K. Downie
University of Victoria

During the 1980's there was an increasing realization that centrally controlled environmental protectionism and management were: failing to meet conservation goals; failing to provide benefits for people and communities; and, increasingly alienating people from protected areas and government. In response, there emerged a movement towards community-based natural resource management to improve benefits to communities and to provide economic incentives for conservation. Parks agencies in Africa also sought cooperative approaches with local communities in the management of national parks and began establishing programs to generate community benefits from conservation, develop more amicable relationships with communities and reduce poverty. Proponents of these efforts suggest that communities are increasingly involved in and directly benefit from engagement in conservation policy development and application. Critics argue that real poverty reduction and food security have not been achieved and that benefits from conservation are not equitably distributed or don't offset significant costs and negative impacts.
In Tanzania, the National Parks Agency [TANAPA] began a community outreach program in the early 1990's. Over the intervening years TANAPA has made efforts through this program to improve the flow of benefits to address poverty. It has also conducted periodic independent program reviews to identify weaknesses and provide policy advice to more adequately achieve its objectives. This paper assesses the progress of TANAPA's community engagement efforts as experienced by communities adjacent to Saadani National Park and identifies additional avenues for policy and program improvement

RECESSIONS AND RESTRUCTURING IN ECONOMIC GEOGRAPHY: THE EVOLUTION OF BRITISH COLUMBIA'S FOREST SECTOR 1980 - 2010

Klaus Edenhoffer and Roger Hayter
Simon Fraser University

Recessions are often portrayed as deviations from a state of "normality" or "equilibrium", defined by rises and falls in output levels. Recessions, however, play an important role as turning points qua crises that facilitate, or are in some way associated with, with the restructuring of economies – profound qualitative as well as quantitative changes in the underlying economic, technological and institutional conditions of production. Yet, recent pleas for an evolutionary economic geography have so far neglected the role of recessions or crises in general as a vital feature of market economy dynamics, evident at multiple scales. This paper reflects on the interpretation of recessions as turning points, emphasizing their geographically as well as temporally contingent nature. The argument is illustrated with reference to the BC forest economy that has been restructuring since the extraordinarily severe recession of the early 1980s. Yet, the direction of change remains ambiguous as Fordist and neo-Fordist industrial structures persist with newly emerged, small and flexible plants, often in different locations.

NEW RELATIONSHIPS BETWEEN JAPANESE AND TAIWANESE ELECTRONICS FIRMS

David W. Edgington, University of British Columbia
Roger Hayter, Simon Fraser University

In this paper we examine the cultural dimensions of production networks between Japanese and Taiwanese firms. Conceptually, we argue that due to historical and cultural ties between the two countries, as well as long-standing association with Taiwanese suppliers, Japanese lead firms have deepened their relationships as Taiwan has entered a more technologically-based stage of development. Taiwan has also been pivotal in Japan-Taiwan-China relations because of its cultural as well as geographic proximity to both economic giants, and it has also been central in the development of modular manufacturing systems. Empirically, the analysis draws on interview with 16 Japanese electronics companies in Taipei and Hsinchu Science City, as well as secondary data of Japanese trade and investment in Taiwan. We contend that Japanese lead firms have moved to a position of insiders and partners with their Taiwanese suppliers in the information, technology and communications sector. In addition, Japanese electronics firms now see Taiwan as a viable bridge to production and markets in mainland China. The study notes that there are challenges and limits to these new forms of relations.

GEOGRAPHY OF FATHERHOOD IN EDMONTON: WHERE ARE EXPECTANT AND PARENTING YOUNG FATHERS?

Cameron Edney and Julie Paquette
Terra Centre for Pregnant & Parenting Teens

Despite the serious social implications of teenage pregnancy and the importance of father involvement, in the area of social support young fathers are often overlooked in favour of young mothers. Research demonstrates there is a great need for young fathers to be recognized and supported. This poster discusses the distribution of Edmonton's young fathers based upon data from the Edmonton Terra Centre for expectant and parenting teens. The Edmonton Terra Centre is a local organization which offers individual and group support for young mothers and fathers, along with child day-care services. Through involvement with a Terra-backed research team, the Centre has permitted access to a database containing comprehensive geographical and social information on their clientele, who are generally lower class young parents with little social and financial support. The purpose of this poster is to display and analyze the aggregated distribution of newly enrolled young fathers active in Terra's services in 2010. The vast majority of enrolments (both male and female) become active participants between 3-months pre-natal and 1 year post-natal. This poster displays a current portrayal of geographic trends of new and young fathers within Edmonton and area for the purpose of identifying concentrations and suggesting strategies to enhance the Terra Centre's support network.

THE MOTORS OF ECOTOURISM REV IN TORTUGERO, COSTA RICA

Nick Ehlers and Zoë A. Meletis
University of Northern British Columbia

Achieving sustainable ecotourism requires continued community feedback and research. As a human geographer of the environment, I will investigate motorboat use in the ecotourism destination of Tortuguero, Costa Rica (including Tortuguero National Park, est.1975). Local people have expressed concerns about ecotourism-associated increases in boat use (e.g. 1998 - 16,834 visitors; 2008 - 134,690 visitors) (Aguila 2009; Meletis 2007). Located on a narrow strip of rainforest between ocean and freshwater, and without roads or cars, the community of Tortuguero is heavily reliant on boats. The 'roads' of Tortuguero are canals, rivers, and

lagoons that provide transportation corridors for a diverse group of locally-living people and visiting tourists. These fresh waterways are also home to fishes, caimans, crocodiles, crustaceans, birds, turtles, and the endangered West Indian Manatee—all of which are desirable as part of the local ecosystem and as part of tourist attractions and experiences. Since there have been no significant efforts to combine data on boat use and impacts with data on perceptions, gathering background motorboat data is an important first step. I am therefore conducting research for a 'best practices' document about motorboat use. This document will inform my impending field study of the local responses to motorboat use and the related impacts in Tortuguero. I will present my work-to-date, while addressing greater considerations in local efforts to strike a balance between ecotourism and conservation in a place where forgoing motorboats is impossible, since it is intimately tied to the local ecotourism economy and associated livelihoods.

HABITAT MAPPING OF A PROPOSED MARINE PROTECTED AREA

Rachel Elliott
University of Victoria

Mapping of marine habitats is increasingly being used to determine the distribution and structure of habitats within marine ecosystems. It is particularly useful in marine protected area (MPA) planning and management to ensure the representation of heterogeneous and diverse habitats. This project used a towed underwater video camera to obtain footage of habitats in a proposed community based MPA located on the Ucluth Peninsula, on the west coast of Vancouver Island. Based on GPS waypoints taken in the field, video footage was georeferenced using ArcGIS, and visually analysed to determine the structure and distribution of habitats. Habitats were classified based on dominant substrate types and plant species present, and mapped to determine their spatial extents within the study area. It was found that the bays support a range of habitats and associated species. Knowing the distribution and structure of the different habitats present in the study area is essential to moving forward with the establishment of conservation and management regulations for the region.

USING ALOS/PALSAR, RADARSAT-2 AND ENVISAT/ASAR IMAGERY TO DEFINE THREATENED SPECIES HABITATS IN THE BRAZILIAN PANTANAL

Teresa Evans, Maycira Costa, Walfrido Tomas, Thiago Silva, Kevin Telmer
University of Victoria

The Brazilian Pantanal is a large continuous tropical wetland with large biodiversity and many threatened habitats. The interplay between the distribution of vegetation, the hydrology, the climate and the geomorphology nourishes and sustains the large diversity of flora and fauna in this wetland, but it is poorly understood at the scale of the entire Pantanal. This study uses multi-temporal L-band ALOS/PALSAR and C-band RADARSAT-2 and ENVISAT/ASAR data to map ecosystems and create a lake distribution map of the Nhecolândia region in the Brazilian Pantanal. A Level 1 object-based image analysis (OBIA) classification defining fresh and brackish lakes was achieved with accuracy results of 98%. A Level 2 classification separating two types of fresh lakes and brackish lakes achieved with accuracy results of 81%. The preliminary analysis of distribution of lakes in relationship to the marsh deer distribution showed that during the dry season, the marsh deer are in close proximity to permanent waterways such as the Rio Negro (Southern border of Nhecolândia) and the Rio Taquari (North-western border of Nhecolândia). During the flood season the deer begin to migrate away from the more deeply flooded low-lying areas and into the shallower, seasonally flooded areas, following the flooded/dry interface. However, the deer do not migrate into the central part of Nhecolândia, suggesting that the aquatic vegetation found in the fresh-water lakes alone is not enough to sustain the deer's diet, regardless of season.

SPATIAL VARIATION OF DISSOLVED AND PARTICULATE ORGANIC CARBON CONCENTRATIONS ALONG THE FRASER RIVER, BRITISH COLUMBIA

Jenna Fanslau1, Bryce Downey1, Steven Marsh1, Sharon Gillies1, Alida Janmaat1, Bernhard Peucker-Ehrenbrink2, Britta Voss2, Ekaterina Bulygina4, Gregory Fiske4, Timothy Eglinton2,3, Daniel Montluçon2,3, Helena Fraser2, Garrett Macklam-Harron2, Brayden Wiebe2, Michelle Martinec2, Carl Johnson2, and Scot Birdwhistell2
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4 Woods Hole Research Center, Woods Hole, USA

With the growing threat of global warming, the need to understand the world's carbon biogeochemical cycle has become increasing crucial. Since rivers provide an important interface between ocean and land, it is important to study the flux of carbon within river catchments. The growing interest in the study of organic carbon as well as related global geochemical cycles sparked the for-

mation of the World River Group (WRG). The Fraser River, included in the WRG project, is one of particular importance. Its unique characteristics include no damming of the main stem, significant seasonal variation in discharge, and diverse geological terrain. Particulate organic carbon (POC) and dissolved organic carbon (DOC) concentrations were measured on samples taken from multiple sites along the Fraser River during the summer 2009. It was found that the POC concentrations varied from 0.05-0.83mg/L and the DOC concentrations varied from 0.21-6.56mg/L. This data was then used to perform a preliminary assessment of the variability of organic carbon concentrations at each of the different collection sites. Geologic terrain, vegetation types, and varying intensities of landuse at each collection site along the Fraser River are used to help explain the variations in POC and DOC concentrations. In addition to analyzing carbon concentrations along the Fraser River, the relationship between POC and DOC concentrations is also examined. These preliminary analyses are critical steps in understanding how the global carbon cycle is influenced by the world's rivers.

A DIFFERENT TAKE ON FOOD

Faulds, Ian and Howard, Hans
Western Washington University

Informal surveys demonstrate that it is easier to obtain expired food products in Vancouver than in Western Washington, which raises the important question of why this occurs. This can be described by hypothesizing that different liability laws in Canada and the USA are key to the difference. The method used to test this was investigation of legal documents and also interviews of managers of grocery stores and food banks as the primary source on both sides of the border. The main focus of the study is the Vancouver metro area in Canada and Bellingham and Western Whatcom County in the USA. We expect to find that Canadian policy and regulation allow for stores to more easily distribute expired food without as much danger of legal prosecution.
We are interested to find where food recourses are more efficiently utilized in this cross border region.

WATCHING AVATAR IN ALBERTA: CAN REFLEXIVITY CLOSE PANDORA'S BOX?

Dr. Michael P. Ferber, The King's University College
Dr. Randolph Haluza-Delay, The King's University College

The film Avatar is replete with examples of reductionism whereby complex natural and / or social systems are distorted. This presentation compares the movie with present examples of the interface of nature, religion and culture surrounding the Alberta oil sands, and uses focus groups of Albertans to probe these interfaces. Like the fictional world of Pandora, agents in Alberta have reduced ecological settings and adversaries in the global pursuit of increasingly unobtainable oil. Aboriginal peoples find their cultural holism reduced to requesting scientific calculations of cancer rates. Following a pastoral letter on the moral issues surrounding oil sands extraction, the local Roman Catholic bishop was told by public, government and industry he should "stay out of their oil sands business." In Avatar the final solution to bio-physical and social reductionism is violence. Yet there are intimations of an alternative solution for ecological contestation: reflexivity. This work weaves the theoretical approaches of the emic / etic problem, Thomas Tweed's concept of crossings and dwellings, and ecological habitus to suggest reflexivity as a potential solution to environmental conflicts such as those in Avatar and Alberta.

STRUCTURAL GLACIOLOGY UPGLACIER OF A TRIBUTARY-TRUNK JUNCTION

Thomas Fox and Hester Jiskoot
University of Lethbridge

Glacier systems are often dendritic, thus composed of a main trunk joined by tributary glaciers. At the confluence of tributaries and trunks a dynamic interaction can take place, resulting in distinct stress fields. An example of this is blocking by a bulging or overriding tributary, commonly observed in surge-type glaciers (Kargel et al., 2005). These stress fields are reflected in specific types of 'structural glaciology' (crevasses, faults, foliation, and folding). In order to investigate the blocking potential of a tributary glacier on its trunk we analysed structural glaciological data on Shackleton Glacier, a large valley glacier in the Canadian Rockies. In an area upstream of a tributary-trunk junction we measured the location, orientation (strike/dip), width, depth, length, density, and type of structures for 93 crevasses, 36 crevasse traces, 9 sediment squeezes, and one 'fountain'. Using GIS analysis, we mapped and evaluated the spatial pattern of the structures. The general ice flow pattern in the study region ranges from slightly extensional (parallel crevasses forming perpendicular to ice flow) to compressive (closing crevasses and crevasse traces, sediment squeezes) to extensional due to a major downstream icefall. Upstream of the active tributary the crevasses are mainly parallel and oriented perpendicular to the incoming tributary, while in the trunk's flow unit opposite the tributary the crevasses are mostly splayed and oriented perpendicular to oblique to the centre flowline. Combined with 5 years of ice flow measurements at ablation stakes, this study contributes to the prediction of the dynamic effects of glacier recession-related glacier fragmentation.

OBESITY AND THE BUILT ENVIRONMENT: A CLUSTER ANALYSIS OF URBAN AND PERI-URBAN COMMUNITIES IN THE GREATER VANCOUVER REGIONAL DISTRICT

Charles Fritz, Nadine Schuurman, Scott Lear
Simon Fraser University

The purpose of this research is to examine spatial clustering of obesity and physical activity and their relationship to specific aspects of the built environment. The prevalence of obesity in Canada has increased since the 1980's to the point that nearly 60% of adults are obese and overweight, and over a quarter is obese. In order to understand the increase, researchers have attempted to construct linkages between obesity trends and the built environment. Several environmental variables have been cited as potential determinants of physical activity and obesity such as: presence of sidewalks, neighbourhood aesthetics, mixed land-use, street connectivity, access to recreational facilities and access to food. Self-reported Individual physical activity and objectively measured height and weight were extracted from a cross-sectional survey of 2000 men and women from 13 communities across the Greater Vancouver Regional District. Morans I test statistic was employed to test for global spatial autocorrelation, and Anselin's Local Moran statistic and Geographically Weighted Regression were employed to test for local spatial autocorrelation. Results from a previous study indicate that higher BMI and lower physical activity are somewhat correlated at the local level however not to correlated to the degree that was hypothesized. A remaining challenge is to determine the optimal methods for detecting clusters of both obesity and high/low physical activity. This exploratory study indicates that local clustering measures may be more suitable for teasing out possible relationships between physical activity, obesity and the built environment.

A CASE FOR 'REPATRIATING' RESEARCH: A REVIEW OF ENVIRONMENTAL GOVERNANCE ON HAIDA GWAII

Lindsay Galbraith and Professor Susan Owens
University of Cambridge

This paper presents a review of environmental governance literature that draws from empirical evidence derived from Haida Gwaii, a series of islands off of the north coast of British Columbia (BC). I describe the unique approach that the Haida Nation has taken on their path toward self-determination by considering a series of battles, alliances, and negotiations that have repositioned them within Canada's environmental and natural resources decision-making regime, and at the leading edge of indigenous self-governance today. An important problem facing many communities undergoing this kind of transition is tracking and using research and other information. I move on to make a case for supporting the 'repatriation' of research that relies on knowledge derived from a particular place. This place-focused review can help, not only situate future environmental governance research on Haida Gwaii, but also gain access to local knowledge in a way that can address a number of ethical dilemmas facing researchers that rely on such knowledge.

GEOGRAPHY IN SCHOOLS (GIS)

Amy Ganton, Kim House, Ian Kopp, Angela Doiron
University of Victoria

GIS is a program run by the Society of Geography Students (SOGS) at the University of Victoria. Our main objective is to raise awareness about Geography, provide information on post-secondary and career options for students, and to engage students in a broader understanding of the discipline of Geography. This presentation will demonstrate techniques used to engage youth, and describe the benefits experienced by high school students, GIS coordinators, and the department of Geography at UVic. We hope to encourage successful outreach programs in communities across Canada, providing an exciting avenue for students who are unsure of what they wish to pursue after high school.

COMPARING SPATIAL ANALYSIS METHODS OF FIRST NATIONS AND RECREATIONAL ACCESS CLOSURES ON THE COMMERCIAL DUNGENESS CRAB (CANCER MAGISTER) FISHERY IN BRITISH COLUMBIA

Amy Ganton, Dr. Rosaline Canessa, Dr. Peter Keller
University of Victoria

As global demand for seafood rises, the need for sustainable management of important fisheries is mandatory for their persistence and longevity. The Department of Fisheries and Oceans (DFO) must make informed decisions as a governing body for marine resources in Canada. In conjunction with DFO in Nanaimo, this research will address some of the issues surrounding resource management. Using the Dungeness crab (Cancer magister) fishery in British Columbia, four closures to the commercial fishery were proposed by First Nation groups in the Mainland area adjacent to northern Vancouver Island. An examination of statistical analysis and various spatial mapping methods was implemented in an effort to understand the elements that are involved in analyzing the

proposed closures. Based on the results, a spatial mapping method with greater accuracy is recommended for the Dungeness fishery.

Knowledge to Action: A Framework for Engaging First Nations in Environmental Health Research
Leana Garraway and Dr. Neil Hanlon
University of Northern British Columbia

Knowledge translation is an effort to make research more meaningful to society. Currently many gaps exist in effective knowledge to action especially for research carried out with socially marginalized individuals and groups. In this presentation, I will outline the framework for my master's research which explores knowledge translation and knowledge to action in regards to environmental health research in, and for, the Takla Lake First Nation (TLFN). Several community-based environmental health research projects have recently been undertaken with members of the TLFN in BC's northern interior. The purpose of my research is to learn from members of TLFN about their experiences participating in these research initiatives, and how they would like to see knowledge collected and mobilized. Employing a Participatory Action Research (PAR) approach, I am interested to see if community members' expectations of the research process have been met, and to hear from community members themselves about strategies and approaches that should be taken to translate knowledge obtained from research into actions that will of the greatest benefit to the TLFN. I will provide a brief sketch of the data and methods I intend to use, and the timeline for completing my thesis research and bringing the findings back to the community. I hope to show that a better understanding of research expectations and ideas is needed to guide future knowledge translation efforts in the areas of environmental health and First Nations research.

AGING IN PLACE(LESSNESS)
Theresa D. Garvin
University of Alberta

Geographical examinations of suburban life suggest that suburbs represent 'placeless' landscapes that foster physical and social isolation. While considerable attention has been paid to the effects of such isolation on specific populations such as women, children, and particular ethnic groups, little attention has been paid to how suburban placelessness impacts the lives of seniors. The work reported here presents research results from a community-based, photo-elicited study with seniors in Edmonton, Canada who identified those characteristics of suburbs that either enable or constrain successful aging-in-place. The resulting discussion identifies the effects of placelessness on seniors including increased isolation and resultant impacts on individual cognitive abilities, implications for support services from both kin and social services agencies, and equity effects as these suburbs experience a social, economic, and age-related 'hollowing out'. Our work concludes that the greying of the suburban fringe will present a unique set of challenges requiring a coordinated response from intersectoral and interdisciplinary perspectives to support healthy aging-in-place.

HOW MODERNISM AND NEW URBANIST VIEWS HAVE HELPED SHAPE MARSHALLING YARDS AND RAILWAY SPACES IN NORTH AMERICAN CITIES
Lise Gibbons
University of Victoria

Marshalling yards and railway spaces in North American cities have changed drastically from the industrial times they were intended for. As post-industrialism commenced, modernism and new urbanist views began to influence these spaces. Due to increasingly limited space within urban and urban fringe areas, many developers, architects, and city planners are turning to marshalling yards and railway spaces for development. Marshalling yards and railway spaces are often deteriorated, not used to their capacity, or unused, and are sought after in order to facilitate city needs. Some of these new uses include mixed-use developments, parks, village centres, and new industrial uses. For the most part, citizens approach these new spaces with optimism and approval. That being said, depending on the proposed plans, it is often inevitable to find citizens who do not approve the change in land-use. Using examples from the United States and Canada, the land-use changes of marshalling yards and railway spaces will be shown. The influences of modernism and new urbanist views will be highlighted through these examples.

DIVERSITY IN END-OF-LIFE FAMILY CAREGIVING: IMPLICATIONS FOR CANADA'S COMPASSIONATE CARE BENEFIT
Giesbrecht, M., Crooks, V.A., Williams, A., Hankivsky, O.

Caregiving has long been recognized as a 'woman's issue' and because of this, gender-based analyses have been prioritized in caregiving research. However, trends in current feminist scholarship demonstrate that gender intersects with other axes of difference, such as culture, socio-economic status, and geography, to shape one's social location and lived experience. Recognizing the importance of considering, simultaneously, multiple axes of difference in caregiving, this analysis aims to explore how formal front-line

palliative care providers understand the role of diversity in shaping family caregivers' experiences within the end-of-life care context. Front-line palliative care providers' employment allows them intimate access into the homes and lived realities of diverse families; thus, they can offer valuable insights into family caregiver experiences, needs, and access to supports. This analysis contributes to a utilization-focused evaluation of Canada's Compassionate Care Benefit (CCB), a social program that provides job security and limited income assistance to Canadian family caregivers who take a temporary leave from employment to provide care for a dying family member. Drawing on 50 semi-structured interviews with front-line palliative care providers from across Canada, thematic analysis of the transcripts reveals that five axes of difference were commonly raised when discussing family caregivers' experiences, specifically, 'culture', 'gender', 'geography', 'lifecourse stage', and 'material resources'. Based on these findings, we demonstrate that re-framing categorizations of family caregivers can expose specific vulnerabilities and inequities while identifying particular implications for the CCB program as it is currently administered. Such findings illustrate how diversity analysis can dramatically enhance evaluative policy research.

SPATIOTEMPORAL BEHAVIOUR OF RAINFALL OVER A 20 KM2 AREA OF THE THOMPSON-BONAPARTE PLATEAU, BRITISH COLUMBIA

Jennifer L. Golden
Thompson Rivers University

From June – October 2009 rainfall was measured using an array of tipping bucket gauges situated throughout a 20 km2 area of the Thompson-Bonaparte Plateau in order to quantify the spatiotemporal variability of this water input. Data from the gauges, in conjunction with their spatial coordinates, were used to compile areal rainfall maps using the inverse distance weighting approach with a raster-based GIS. The spatial variability of areal event rainfall, expressed as a coefficient of variability (CV), ranged from 8 to 125 % and typically decreased with increasing rainfall depth. Accumulative areal rainfall depth variability decreased asymptotically with increasing depth until a CV value of 7 – 10 % was reached once a total of ~20 mm of rain had fallen. Gauge densities of 1 per 1.2 km2 and 1 per 4.7 km2 were found to be required for estimates of mean areal accumulative rainfall ≥ 20 mm at accuracies of ±5 and ±10 % at the 95 % confidence level, respectively. Temporal stability analysis found that 42 % of the gauges had a statistically ($p \leq 0.05$) greater or lower catch than the average area-wide catch. Over the study period cumulative gauge rainfall ranged from 98.4 to 157.1 mm, suggesting that some points within the 20 km2 study area received up to 160% of the rain that fell at other points. A positive linear relationship ($r2 = 0.21$, slope: $p = 0.0673$) between season-long rainfall and elevation was found, with cumulative rainfall increasing with increasing elevation at 0.162 mm m-1.

GEOSTATISTICAL ANALYSIS AND MAPPING OF ENVIRONMENTAL DATA PATTERN

Michael Govorov, Vancouver Island University and Gennady Gienko, University of Alaska

Concentration of fine particulates (PM2.5) is a key indicator of air quality, constantly measured in multiple stations across Canada. Fine particulates are minute solid particles or tiny liquid droplets in the air. When inhaled deeply into the lungs, even small amounts can cause serious health problems. This paper illustrates the use of several spatial analysis and geostatistical techniques for pattern analysis of environmental phenomena, particularly distribution of fine particulates across Canadian territories. Several methods of geostatistical analysis of spatially distributed data were employed in this study, varying from exploratory data analysis (test data for normality, linearity and spatial patterns) and linear regression (to explore correlation and bivariate and multivariate regression, including geographically weighted regression), to linear kriging and linear co-kriging.
Combination of geostatistical methods can be beneficial in several situations. Regression and kriging modeling can be used for prediction at all locations where prediction is required. However, for regression analysis, values of the independent variables have to be available in predicted locations. Kriging modeling can be used to estimate the independent variables in predicted locations with the following use in regression analysis. In addition, if one of independent variables of regression is a coordinate, this variable can be exactly defined in required prediction locations, and thus can improve prediction based on the regression model. In addition to prediction, regression model can be used to examine and explore spatial relationship between dependent variable and independent (explanatory) variables. Key exploratory variables from regression modeling can be used as co-variables in co-kriging modeling.

CHEMICAL PROPERTIES OF THROUGHFALL, STEMFLOW AND FOREST FLOOR BENEATH BIGLEAF MAPLE IN A CONIFEROUS FOREST IN THE PACIFIC NORTHWEST

Khaled Hamdan and Margaret Schmidt
Simon Fraser University

Bigleaf maple (Acer macrophyllum Pursh) is a large deciduous tree that is abundant in western North America. Its native range extends from northern Vancouver Island south into California. We examined the influence of bigleaf maple on throughfall, stemflow,

under-canopy and near trunk forest floor chemical properties in a forest dominated by Douglas-fir (Pseudotsuga menziessi (Mirb.) Franco) and western hemlock (Tsuga heterophylla (Raf.) Sarg.). Eight plots with a single bigleaf maple tree in the center of conifers were paired with eight Douglas-fir plots without bigleaf maple. Compared to conifer plots, throughfall of bigleaf maple had significantly higher pH, K concentration, and deposition of total organic N, P, S, and K. Similarly, stemflow of bigleaf maple had significantly higher pH, and K concentration. The under-canopy forest floor associated with bigleaf maple showed significantly higher CEC and concentrations of exchangeable Ca and Mg. The near trunk forest floor at bigleaf maple plots had a significantly higher pH, concentrations of nitrate, exchangeable Ca, and Mg and contents of total N, nitrate and S. The results suggest that bigleaf maple can modestly improve soil fertility at under-canopy forest floor and to a greater extent in near trunk forest floor within conifer forests and suggests the presence of a soil microsite around bigleaf maple stems which is created by stemfow. These enriched microsites proximal to bigleaf maple trunks can form fertile spots for conifer growth at later stages of forest succession.

INDICATORS OF SUSTAINABLE FOREST MANAGEMENT IN THE GREAT LAKES – ST. LAWRENCE FOREST REGION – A NATIONALLY REPLICABLE SELECTION METHODOLOGY

Mark Hart1, Peter Bush2 and Christian Malouin3
1(Canadian Forest Service, Natural Resources Canada)
2 (Protected Areas Branch, Nova Scotia Environment)
3 (Canadian Wildlife Service, Environment Canada)

Sustainable forest management (SFM), an explicit policy objective in Canada, balances social, economic and environmental values. Internationally agreed upon criteria and indicators of SFM address aspects of these values. One such indicator is the status and trends of selected forest-associated species in recognition that some species rely on particular habitat characteristics (e.g., forest structure and composition) which may be influenced by forest management. To date, this indicator of SFM has not been meaningfully reported on, due to challenges in identifying appropriate forest-associated species and lack of data for those species. This research demonstrates an avian indicator selection methodology that combines Breeding Bird Survey (BBS) data and regional land cover data to determine the strength of forest-associated bird species guild relationships with a suite of land cover composition and structure classes within the Great Lakes - St. Lawrence forest region. Guild abundance trends are then compared with observed changes in land cover composition and structure within the region. The results show that species guilds associated with land cover composition classes (e.g., coniferous forest) have remained stable over the past forty years (1967-2007) and that guilds associated with three land cover structure (mixed forest mean contiguity, dense mixed forest mean contiguity, and coniferous forest patch density) have undergone moderate declines over the same period. These findings reflect land cover changes observed in the region. This work utilizes nationally available data and is thus largely replicable across Canada.

LICHENOMETRIC INVESTIGATIONS OF LITTLE ICE AGE GLACIER ACTIVITY IN THE CENTRAL BRITISH COLUMBIA COAST MOUNTAINS

Harvey, Jill E.1, Smith, Dan J.1, Desloges, Joseph R. 2
1 University of Victoria
2 University of Toronto

Lichenometry describes a methodological approach employing the radial growth characteristic of selected lichen thalli to provide relative ages for late Holocene-aged landforms. Lichenometric research conducted in the central British Columbia Coast Mountains, has contributed to our understanding of glacial history during the Little Ice Age in the Coast Mountains. Lichens growing on prominent glacial deposits were measured at Deer, Fyles, Jacobsen and Pattullo glaciers. The findings of these investigations bolster the results of prior surveys strengthening our understanding of Little Ice Age glacier behavior in this region. The research adds to our knowledge of Rhizocarpon geographicum growth characteristics and provides an opportunity to develop age controls points for establishing a regional growth curve for Xanthoria elegans.

THE SPATIAL GEOGRAPHY OF TOTEM POLES: MARKERS OF LAND AND PEOPLE

Amanda Hein
University of the Fraser Valley

In spite of the general fascination with totem poles by Canadian society, the social and spatial significance of them has not always been fully appreciated. Like maps, totem poles convey important geographical information, including but not limited to people's origin, narratives, oral history, migration and physical location. These themes will be explored through visuals and geographical illustrations throughout the poster. There is a great variance between totem poles and they proved to be a key way for First Nations to communicate with each other. Totem poles have been found throughout the West Coast of British Columbia and the United States. They reveal patterns of the geographical distribution and the geopolitical exchange of indigenous groups. Totem

poles are physical representations of territorial boundaries, historical land use, occupancy, migration and inheritance of their representing communities. With an increasingly truer interpretation of totem poles, a clearer understanding of the people they represent can be had.

IS VEGETATION RESPONSE TO WATERSHED DISTURBANCE RECORDED IN THE PALYNOLOGICAL RECORD OF LOWLAND WETLAND SEDIMENTS?

Emily Helmer and Jonathan Hughes
University of the Fraser Valley

The intent of this study is to investigate how intertidal wetlands on the central coast of British Columbia respond to natural and anthropogenic disturbance by examining fossil pollen grains and spores. Reconstructing paleoenvironments provides insight into how environments change over time and their potential response to future disturbance. Sediment collected from intertidal wetlands at the head of Rivers Inlet was processed to isolate palynomorphs using standard procedures for sandy and peaty sediments. Pollen isolated from the uppermost 30 cm of sediment sampled were identified and quantified to estimate vegetation change over time in response to abrupt sedimentation events and logging. Approximately 30-45% of the pollen flora in surface and subsurface intertidal sediments sampled is comprised of pollen from upland forests including Alnus rubra, Cupressaceae, Picea, Pinus, and Tsuga heterophylla. High percentages of Alnus pollen may correlate with disturbance in the watershed. Around 10% of the pollen flora includes taxa indicative of wetland plants such as members of Apiaceae, Cyperaceae, Plantago, Rosaceae, Salix, and Triglochin. The top 4-5 cm of peaty sediment beneath high elevations on the marsh surface reveal higher counts of Apiaceae pollen compared with lower depths, which identifies a transition in marsh ecology to a more mature system over time and with increasing peat accumulation. The pollen record enables inference of past vegetation assemblages and their response to changes in marsh elevation and sediment texture that accompanies watershed-scale disturbance.

QUANTIFYING FLOW RESISTANCE DUE TO CLUSTERS IN GRAVEL-BED RIVERS

Megan L. Hendershot and Jeremy G. Venditti
Simon Fraser University

Cluster bedforms are common microtopographic features in gravel-bed rivers formed by the accumulation of smaller grains about larger stones during the transport process. There have been several investigations of how cluster bedforms develop and how they impact near bed flow and turbulence. There have also been suggestions that cluster bedforms contribute form resistance to the total flow resistance in open channels. However, there has been little work designed to explicitly quantify this contribution. Here we present flume experiments examining macroscopic flow conditions over fixed arrays of clusters with a variety of flow strengths. The clusters were created with the largest grains in a log-normal grain-size distribution. The experiments show that adding a regular array of clusters to an otherwise flat gravel bed increases flow resistance coefficients by ~5%. Doubling the cluster density doubles the effect. Rearrangement of the clusters from a regular to a random arrangement causes a further increase (~16%) in flow resistance relative to a flat bed. The results confirm previous suggestions that the presence of clusters increases flow resistance. The density and arrangement of clusters appear to be important determinants in the magnitude of the flow resistance effect. The modest impact of clusters on flow resistance coefficients suggests that the greatest contribution to the total resistance comes from the presence of the gravel-bed and not the cluster features that form during the transport process.

THE BOREAL FOREST UNDER IPCC CLIMATE WARMING

Tyler Herrington and Dr. Owen Hertzman
Simon Fraser University

This paper defines the boreal as a forest biome consisting of three sub-zones: the boreal-grassland transition zone, the predominantly forested region and the forest-tundra transition zone.
Using this framework, the author develops six future climate scenarios; two for each sub-region, based upon predictions outlined in the IPCC's ar4 report and the 20th century climate scenarios supplied in Singh and Powell (1986). Predictions on how the range and species assemblage of each sub-region were then developed using a hybrid climatological and biogeographic approach.
In the boreal-grassland transition zone, a greater likelihood of fire and drought, caused by increasing evapo-transpiration and warmer temperatures in the summer, combined with a decrease in summer precipitation would favour a northward advance of the prairie grassland ecosystems.
Drier soil moisture conditions during late spring and summer, caused by reduced permafrost coverage, combined with increased rates of evapo-transpiration, would significantly increase the frequency of fire in the predominantly forested region. This would likely favour the shade-intolerant white spruce (over black spruce) which is adapted to drier soil moisture conditions and a richer

soil nutrient regime.
In the forest-tundra region, the growing season would be extended by about 5 weeks, and this, combined with lower winter-time temperatures would likely favour a northerly advance of the arctic tree-line into the current high and low shrub tundra zone. Drier spring and summer soil moisture conditions, however, may cause increased stress for spruce trees in this region, and would favour a northward expansion of Jack pine into the forest-tundra transition zone.

AUTOMATED PROCEDURE FOR DIGITAL LANDSCAPE CLASSIFICATION BASED ON DEM DATA AND FUZZY LOGIC
Brandon Heung (Simon Fraser University), Chuck E. Bulmer (BC Ministry of Forests and Ranges), and Margaret G. Schmidt (Simon Fraser University)

Using a digital elevation model (DEM), a preliminary procedure for the automated classification of landscape features was developed through the implementation of expert-knowledge and fuzzy logic sets. Morphological terrain attributes such as plane curvature, profile curvature, total curvature, topographic wetness index, and slope were used to identify concave, convex, and depression landscape characteristics. Additionally, a single-direction flow routing algorithm (D8) was implemented in the identification of relative topographic slope positions. Fuzzy attribute rules and weights were derived from the semantic meaning of each landform class using ArcGIS and ArcSIE. This procedure resulted in the identification of 15 unique landforms defined by flow characteristics and slope position. Model results, in the form of hardened maps, were semantically valid within the range of rules used to define each landform. Furthermore, the effect of resolution was tested using 25m, 100m, and 175m DEMs where decreases in resolution showed a loss in local curvature and a gain in planar landforms. Future sensitivity analysis will be performed where the impact of neighbourhood size, used to calculate various terrain attributes, will be explored. The proposed method can aid in digital soil mapping and ecological mapping, as well as contribute to the fields of hydrology, geomorphology, and soil science.

VEGETATION VARIATION ACROSS LAGG FORMS OF RAISED BOGS IN COASTAL BRITISH COLUMBIA
Sarah Howie and Ilja Tromp-van Meerveld
Simon Fraser University

Raised bogs often include a perimeter transition zone commonly referred to as a “lagg”. The lagg zone has received relatively little research attention in the past, but several researchers have recently noted that this landscape feature may be critical for maintaining the hydrological viability of a raised bog because it assists in maintaining high water levels within the peat mass. Detailed research is currently underway to develop a better understanding of lagg hydrology, hydrochemistry, and ecology for raised bogs of coastal British Columbia. Lagg forms in this region are highly variable and are influenced by topography, climate, and the surrounding mineral soils. Preliminary results indicate an increase in tree height and diameter across the transition from bog to lagg to mineral site. Tree density was highest in the outward sloping margin of the bog (i.e. the rand) where the water table was lowest. Tree species were variable and specific to the local climate of each bog; Pinus contorta was common in Graham Island bogs (Haida Gwaii), whereas Thuja plicata and Chamaecyparis nootkatensis dominated in bogs in the Prince Rupert area. Sphagnum cover was variable in the north coast bogs, but generally decreased across the lagg transition. Carex cover was generally low, but spiked at the margin of bogs with a well-defined lagg. Total species richness was highest in bog vegetation plots, and decreased through the lagg transition. Research in 2011 will focus on the laggs of raised bogs on Vancouver Island and in the Lower Mainland.

OPTICAL DATING STUDIES OF LAVA-BAKED GLACIOFLUVIAL SEDIMENTS, WELLS GRAY VOLCANIC FIELD, BRITISH COLUMBIA
Daniel Huesken, Justine Cullen, and Olav B. Lian
University of the Fraser Valley

The Wells Gray – Clearwater volcanic field, located in east-central British Columbia, is composed of numerous Pleistocene volcanic events. The lava flow events span the Pleistocene ranging as old as 3.2 Ma and as young as 7560 ± 110 Bp. Many of these flows coincided with the Cordilleran Ice sheet, where the lava flowed subglacially over basal glacial sediments. A block of glaciofluvial sediment for optical dating was extracted from an exposure in a road cut ~ 1 km west of Dawson Falls; the sample was located directly below surface lava flow previously dated to 300 – 500 ka by whole-rock K-Ar dating. However, this whole-rock age may be too old. The oxidized character of the sample suggest that it was heated to a high temperature, which, in turn, suggests that it was in direct contact with the lava flow during its emplacement. This situation would likely allow the sediment grains to be exposed to temperatures high enough to effectively reset the luminescence signal. The sample was processed in the Luminescence Dating Laboratory at University of the Fraser Valley. Standard procedures were used to isolate medium-sized quartz sand and fine-grained feldspar silt from the bulk sample. Variations of the single-aliquot regenerative-dose (SAR) technique were employed on both mineral fractions. The results suggest that the heating event, and the emplacement of the lava, occurred much more recently than previously though, and likely not before the penultimate glaciation.

MENTAL MAPS OF TOURISM IN VIETNAM

Keith Iverson
Western Washington University

Abstract: This poster will summarize the findings of a general mental mapping study conducted around the country of Vietnam. The subjects of this study are randomly chosen native Vietnamese citizens, Vietnamese tour guides, and tourists. The purpose of this exercise is to discover whether Vietnamese people identify areas of higher economic development as good tourist spots. In particular, short surveys and mapping exercises will be given to willing participants in areas throughout Vietnam. The surveys and mapping exercises will ask that the subject identify areas of interest to tourists. Upon return from Vietnam, I will report on any findings through the use of a poster.

MERCURY METHYLATION AND SULPHUR-REDUCING BACTERIA IN SUB-ARCTIC LAKE SEDIMENTS

Jocelyn A. Joe-Strack and Ellen L. Petticrew
University of Northern British Columbia

Mercury generated by distant industrial sources can be atmospherically transported to arctic regions and deposited to the ecosystem through precipitation events. Once delivered, Hg is subject to various species transformations, which are determined by the local environmental conditions. Hg can bind with sediments and be transported via runoff from snowmelt and rainfall events to aquatic systems. In lake bottom sediments, Hg is converted to toxic methylmercury (MeHg) by a group of microbes known as sulphur-reducing bacteria (SRB). The alteration of inorganic Hg to MeHg enables its bioaccumulation through the food chain, causing potential harm to aquatic and terrestrial organisms as well as humans. Investigations to identify bacterial production of MeHg in northern ecosystems will help assess the possible impact on higher organisms. Currently, the role of SRB in mercury methylation has been restricted to temperate and marine environments.
In this study, a predictive relationship of total Hg and MeHg with SRB and total bacteria will be developed for Kusawa Lake, Yukon (136˚203'W, 60˚258'N). Sediment cores were extracted from the sub-arctic lake in March 2010 and are currently being analyzed for total Hg, MeHg, trace metals, organics, diatoms, total bacteria, SRB and will be dated using 210Pb and 137Cs isotopes. Traditionally, local First Nations people used Kusawa Lake for hunting and fishing and as an annual gathering place. Today, the lake is a well-used recreational site for activities such as boating, camping, hiking, fishing and hunting. Determining the impact of mercury on the lake's ecosystem will help contribute to future risk management strategies regarding northern contaminants and ecosystems.

WHO ARE CANADA'S MEDICAL TOURISTS? AN ACCOUNT OF CANADIANS' INVOLVEMENT IN MEDICAL TOURISM FROM THE PERSPECTIVES OF FACILITATORS

Rory Johnston, Valorie A Crooks, Krystyna Adams, Paul Kingsbury, and Jeremy C Snyder
Simon Fraser University

Medical tourism, defined as people intentionally leaving their home country to access non-emergency medical care abroad, is an increasingly popular option for patients worldwide. As medical tourism has grown in an unregulated manner with no oversight, very little is known about the motivations, numbers or demographics of patients embarking on medical tours. Accompanying the expansion of the industry has been the development of cottage industries of medical tourism facilitators in many countries, including within Canada. These facilitation companies assist medical tourists with arranging care abroad. To address the dearth of empirical research into medical tourism more broadly, and regarding Canada more specifically, we interviewed Canadian medical tourism facilitators in order to gain a unique perspective on the scope and scale of the industry. Facilitators from across Canada were invited to participate in semi-structured phone interviews that probed their perspectives on Canadian medical tourists. Twelve facilitators were interviewed, who collectively assist approximately 1600 Canadian medical tourists annually. In this presentation we focus on their insights regarding: the range of destinations they send patients to; estimated patient flows; their clients' demographic characteristics; and patients' motivations for leaving Canada to access health services abroad, and for using a facilitator to do so. To the best of our knowledge, this is the first scholarly account of medical tourism facilitators' perspectives, and provides a qualitative baseline for measuring future developments in the Canadian medical tourism industry.

A DECONSTRUCTION OF CROSS BORDER COOPERATION THEORY: DISTILLATION INTO FOUR DIMENSIONS

Riley Jones and Patrick Buckley
Western Washington University

In the past, borders functioning as barriers have spurred economic activity by creating a differential in either economy or politics

that can be exploited. Due to increased globalization and the decentralization within nation-states, the nature of borders and the development of cross border linkages have changed, resulting in increased scholarly examination. No longer are theories based only on economic activity or the social construction of space adequate to address the nature of activity in border areas. Current studies are now focusing on an exploration of the mechanics of cross border cooperation (CBC) resulting in cross border regions (CBRs).
This increased scrutiny has yielded many differing hypotheses concerning what constitutes CBC or a CBR. As a result, empirical evidence garnered from different border areas has sparked varying conceptions of CBC and CBRs. This paper's aim is to make sense of prominent cross border voices by deconstructing CBC into four dimensions: social, scalar, mobilization of discourse, and structure of governance institutions in hopes of distilling common threads between these viewpoints.
From this deconstruction of CBC and CBR theory, the hope is that a framework derived from the interplay of the four dimensions can be applied on the ground in any border area to adequately observe actual instances of CBC.
While the authors acknowledge that there can be more voices in this discourse, the hope is that this paper will provide greater clarity and serve to prompt further discussion.

THE GEOGRAPHY OF RESIDENTIAL SCHOOLS; WITHIN BRITISH COLUMBIA
Nicole Joseph
University of the Fraser Valley

Residential schools have their own unique geography that is created both regionally and internally. Residential schools have been strategically located for many purposes, such as deterritorialization and isolation to achieve one goal; assimilation. Residential schools are situated advantageously so that each child is disconnected from his or her community and family. Residential schools also have their own internal geography that I believe is based on Panopticism. The theory of Panopticism is not only based on surveillance but discipline as well. I will look at Residential schools within British Columbia with a focus on the internal structure of St. Mary's in Mission British Columbia. I will photography St. Mary's vicinity because it is based upon the same panoptic design as other residential schools across Canada.

EXPLORING THE PLACE OF A BIOSPHERE RESERVE IN THE IGALIRTUUQ CONSERVATION INITIATIVE, CLYDE RIVER NUNAVUT
John L. Kearns and Maureen G. Reed
University of Saskatchewan

In northeastern Canada, the establishment, management, and governance of conservation areas have changed with the negotiation and formation of Nunavut. Key characteristics of designation now include the negotiation of impact benefit agreements for legally protected conservation areas, collaborative planning and management of protected areas, and more clearly defined rights and benefits with regards to lands and resources. The Igalirtuuq conservation initiative (also now known as the Ninginginaq National Wildlife Area) is an ongoing effort by residents of Clyde River to protect and manage important whale habitat off Baffin Island spanning over two decades. Early planning called for the protection of both whale habitat and archeological sites, and as a means to this end and
international biosphere reserve designation was proposed. Throughout the negotiation of Nunavut, top priority seems to have been placed on the establishment of a National Wildlife Area, rather than a biosphere reserve. With the National Wildlife Area now in place, it is unclear whether a biosphere reserve is on the agenda. Similar to the establishment of conservation areas in Nunavut, process mandates and mechanisms for internationally designated biosphere reserves have changed much in the past two decades. As such, this ongoing research project aims to trace the history of this biosphere reserve proposal and to describe the fit of the objectives of a biosphere reserve with the interests of the conservation initiative participants. It is hoped that this will help those who are interested in adopting or improving the biosphere reserve model, or other similar arrangements.

PERFORMING PRIVILEGE FOR PEACE: PROTECTIVE ACCOMPANIMENT IN COLOMBIA
Sara Koopman
University of British Columbia

In a conflict zone some people, particularly certain outsiders, are less likely to be attacked than others. When more privileged bodies stand alongside those under threat, certain armed actors are less likely to attack. Protective accompaniment uses the fact that certain lives 'count' more (because of geopolitical/geoeconomic/racial privilege, which are hard to untangle), to build a world where everyone's lives 'count' – where it matters if a small farmer is killed in Colombia. But day to day as they move through warscapes, how do accompaniers make it clear to armed actors that their own lives 'count' without reinforcing the systems of domina-

tion that give them that privilege?

A GEOGRAPHIC INFORMATION SYSTEM (GIS) FOR MUNICIPALLY ENABLED SUSTAINABLE AGRICULTURE (MESA)

Dr. Parthiphan Krishnan
Kwantlen Polytechnic University

There is growing awareness that urban, sub-urban and peri-urban landscapes are necessary parts of British Columbia's agri-food system to enhance the economic and social vitality of our communities while ensuring the biodiversity and viability of local agriculture.
The current research aims to identify practical strategies for enhancing the City of Surrey's current and future agriculture, in particular those that help to increase agricultural and economic diversity, as well as local and regional food production and food security. The goal is to increase local agricultural capacity and resilience in response to community-expressed interests for diversified local food system that can withstand pressures from the effects of greenhouse gas emissions and associated climate change.
The research uses an integrated systems approach to develop a GIS model to identify effective, implementable and innovative strategies in support of municipally enabled sustainable agriculture (MESA). A four-phased approach guides the development of the GIS. Phase 1 addresses the research's baseline by establishing the current state of agriculture in the City of Surrey. It analyzes the current economic and land use realities with respect to the processes that lead to agricultural land being lost to other uses. These parameters serve as inputs to generate a framework for implementing strategies for sustainable agriculture in Phase 2. Phase 3 will test the framework by using the research results for case studies design briefs, before implementing the strategies for enhancing agriculture in the City of Surrey in phase 4.

SPANISH BANK CREEK RESTORATION PROJECT: A CRITICAL ECOLOGICAL EXPLORATION INTO IT'S PROGRESS AND GOVERNMENT-COMMUNITY ENVIRONMENTAL INITIATIVES

Daniel Lai, Corey Anne Campbell, Cheryl Tam, Laura Pfister, Amna Rathore, Owni Toma, Timothy Wong
University of British Columbia

This study explores the effects of government initiated community sustainable programs. Case study evidence from Spanish Bank Creek suggests that community programs can have positive community cohesive engagements and assume the role of a significant community education program. Spanish Bank Creek is a small stream flowing from Pacific Spirit Park into the Burrard Inlet. Although it is minuscule, it embodies a wealth of culture, history, and tradition that signify Vancouver as an environmental-driven city. The Spanish Bank Creek rejuvenation program not only day-lights the stream, but also provides a platform for the community to engage and experience the benefits of sustainable initiatives. This study investigates the history of the stream, examines the current condition of it's health, and considers the future sustainability of the area. Furthermore, this study analyzes the cooperation between the different levels of government, NGOs, local community, and educational institutions. We also proposed several approaches to public initiatives that carries a trickled down effects that benefit various parts of the community.

SIMULATION OF URBAN LANDSLIDES : CELLULAR AUTOMATA APPROACH

Terence Lai and Suzana Dragićević
Simon Fraser University

Landslides pose a serious risk to human lives and infrastructure. Accurate modeling of landslides can reduce losses by improving predictions of runout areas. Modeling landslide runout is challenging because calculating the fluid flow of the landslide front by differential equations has typically required vast amounts of data and high computational resources. Given the complexity of the phenomenon, cellular automata approach is chosen as it takes into account both spatial and temporal components. In this study, cellular automata is developed for predicting spatial dynamics of landslide runout, where only land-use data and a high resolution digital elevation model (DEM) were used. Parameters, such as slope, aspect, and curvature, are derived from the DEM and coupled with logistic regression as inputs for the cellular automata model. The developed model is implemented on urban landslides that occurred in North Vancouver, Canada. In order to test the landslide cellular automata model, calibration and sensitivity analysis were performed to determine the influence of initial failure location to landslide flow. Results from the study site comparing simulated landslide runout to obtained maps of the real landslide depict an average accuracy of 80%.The significance of this study is the proposed approach of cellular automata is capable of simulating complex behavior both spatially and temporally, while being cost-effective by avoiding high data requirements for model input.

EXAMINING THE SPATIAL ACCESSIBILITY OF TRAUMA SERVICES IN CANADA USING GEOGRAPHIC INFORMATION SYSTEMS

Fiona Lawson (Simon Fraser University), Nadine Schuurman (Simon Fraser University), Lisa Oliver (Statistics Canada), and Avery Nathens (St. Michael's Hospital, Toronto)

The purpose of this research was to evaluate the potential spatial accessibility of trauma services in Canada through the examination of the spatial relationships between the population of severely injured patients and trauma centres. Severely injured patients were identified through the Hospital Morbidity Database using ICD-10 diagnoses codes and the Canadian Mortality Database using external cause of injury coding. The six-digit postal codes of the patients' residences, which were used as a proxy for the site of injury, were translated into geographic coordinates using the Statistics Canada Postal Code Conversion File. Geographic information science methods were then used to generate one hour trauma centre catchment areas and link them to the spatial distribution of severely injured patients in order to determine the proportion of severely injured patients living within one hour of a trauma centre. Several regional clusters were identified that had high numbers of severe injuries and very distant trauma centres. Access to trauma care in rural and remote regions of the country was particularly sparse or in many cases so distant as to be non-existent. The creation of strategically located trauma centres based on the findings of this study could help to improve geographic inequities in service provision.

AT HOME: HABITATS FOR POLICY CHANGE

Joseph Lent
University of British Columbia

In November of 2010, the Mental Health Commission of Canada (MHCC) launched At Home/Chez Soi, a national housing research and social development project unlike any of its kind seen before in North America. The At Home/Chez Soi project contributes greatly to the foundation of 'Habitats for Diversity' by working to overturn the stigma of mental health in Canadian society and also working towards a politics that includes, rather than excludes, our fellow Canadian residents who find themselves without a home. The research aim is to determine the best approach to services and housing for those who suffer from mental illness by studying two groups of research participants: the first group will receive social services coordinated through the At Home/ Chez Soi housing program, and the second group will access social services already available within their cities. At Home/Chez Soi in Vancouver is currently housing those who face homelessness and drug addictions, and provides a regional lens for a discussion about how housing policy might figure into our much broader conversation about 'Habitats for Diversity'. The At Home/Chez Soi project does not represent any change to existing federal social policy in Canada but is rather an example of community social planning coordinated at the national level. The concurrent goals of social housing provision on one hand, and the development of a comprehensive social policy research program on the other hand, reflect an incremental approach to planning from which valuable social policy data may provide new legs for policy change in Canada.

BEDFORM GEOMETRY AND MIGRATION UNDER BEDLOAD-, MIXED- AND SUSPENDED-DOMINATED TRANSPORT STAGES

Martin Lin and Dr. Jeremy G. Venditti
Simon Fraser University

Bedform migration rate is important for estimating sediment transport in rivers. Migration rate is difficult to estimate because current theoretical approaches have limited practical use and empirical relations between R and various flow parameters (e.g. mean velocity, Froude number, velocity head) are not well defined. Here, we explore the relation between the transport stage and migration rates. Transport stage (defined as the Shields number divided by the critical Shields number) is known to control bedform geometry (height, length, aspect ratio), which should directly influence migration rate. Here, we use a newly installed bathymetric swath-mapping system (SMS) in the Environmental Fluid and Sediment Dynamics Laboratory at Simon Fraser University to collect real-time, high-quality bed and water surface topography data under bedload-, mixed- and suspended-dominated transport stages. High-resolution bed topography shows average bedform height and aspect ratio increase when flow goes from bedload-dominated to mixed, then decrease from mixed to suspend-dominated transport stage. Average bedform length and average migration rate increase with transport stage. Migration is dominated by translation under bedload-dominated conditions, but bedform shape deformation increases with transport stage, which leads to grater variability in migration rate and bedform geometry.

REVEALING THE URBAN GAZE: 3D VIEWSHEDS FOR GEOVISUAL ANALYTICS

Chris Lonergan and Dr. Nick Hedley
SImon Fraser University

Urban cores are structurally complex three-dimensional environments. Conventional 2D GIS view-shed methods are inadequate for

calculating sightlines and privacy indices in such structurally complex environments. This research project considers the limitations of conventional 2D GIS view-shed analyses, and explores the potential of 3D view-sheds implemented as a form of geovisual analytics in urban privacy analysis. Three separate prototypes were built to explore the potential of 3D view-sheds for visual analytics in urban environments. The first geovisualization prototype demonstrates a new 3D view-shed analysis method that reveals the 'gaze' of mobile surveillance platforms (such as Google's StreetView vehicles) in urban canyons over space and time. The second prototype explores how 3D view-sheds reveal 'panoptic' patterns of 'urban gaze' and variable privacy in dense urban environments by projecting inter-structure 3D viewsheds between buildings. The third geovisualization prototype reveals hidden zones of variable privacy by projecting 3D viewsheds through a city's major streets and topography in three dimensions. These visualizations reveal the potential of 3D view-shed methods to reveal and visualize sources of surveillance and zones of relative privacy, as elements of 'The Urban Gaze'. This approach reveals hidden spatial privacy relationships in urban environments, and demonstrates new ways to calculate and make explicit the geometry of urban privacy in three dimensions. We conclude by suggesting new geovisual analytical applications that might be possible as a result.

THE VALUE OF FOCUS GROUPS IN QUALITATIVE RESEARCH

Teresa Looy, Jeremiah Basuric
The King's University College

This poster explores the benefits and challenges of using focus groups in qualitative geographical research by critiquing an undergraduate-led focus group. The study was designed to determine whether a relationship exists between environmental attitudes and eschatology, which is the set of beliefs one holds about the ultimate destiny of humans and the Earth. Eschatology may reflect a larger worldview concerning the role of humans in nature. The focus group involved seven students from The King's University College in Edmonton, Alberta. It was evident from the study that focus groups have the potential to provide insight not only for the researchers but also for participants, who walk away enriched by the experience and often stimulated to explore more on their own. Focus groups are particularly effecting for exploring at complex topic such as environmental attitudes, because dialogue with participants can lead to unexpected revelations. However, there are also many challenges to using focus groups. Lessons learned include issues of validity such as generalizability, homogeneity of the sample, and proper facilitation of the group by researchers. Despite these weaknesses, focus groups remain an efficient method and effect research tool to gather large amounts of rich data in a relatively short period of time.

INTENSIVE URBAN POLYCULTURE AGROFORESTRY ON VANCOUVER ISLAND

Christine LoScerbo, Michael Tripp
Vancouver Island University

Nanaimo's sprawling urban development is a common example of many North American urban systems. This environment has challenged our food system which currently relies on industrial agriculture and international trade to provide the means of sustenance for densely populated areas. Local land has been covered by urban infrastructure, made unsuitable for farming, and attracts too few farmers to support large-scale food production. This issue is a priority for Vancouver Island, where ALR land is increasingly encroached upon for residential development and local food production has decreased by 75% in the last 50 years. My study is fueled by the questions: How can food production be incorporated into existing urban parcels within city limits? Can small plots within existing residential and commercial developments reinvigorate urban food production?
Taking advantage of south-facing aspect and micro-environments, an existing 5000 square foot residential lot in Nanaimo serves as an example of how to create a workable, community strengthening, and resilient vision of future city lot food production. The Planting, spacing and growth patterns mimic the natural distribution of forest ecosystems. This case study shows how residential densification and perennial edibles cohabitation for small plots within urban environments in a temperate climate. By detailing the diversity of plantings, estimated harvest volumes and distribution processes at this locale, it can be demonstrated that ecologically harmonious connections between residential neighborhoods and urban food production, as well as increased food security, can be achieved.

DIVERSITY OF NATURAL RESOURCE REGIMES IN NORTHERN CANADA

Julia MacKenzie
Indian and Northern Affairs, Resource Policy and Programs Directorate

Natural resource management regimes and environmental legislation in Canada's three northern territories have developed in very different ways to those in Canada's southern provinces. Although both are abundant in natural resources, in the south, natural resource management is within the jurisdiction of the provincial government, while in the north, it has historically been the juris-

diction of the federal government. Both the federal role and resource regimes are changing quickly however – due in part to the settlement of modern comprehensive land claims and self-government agreements over the last few decades, and in part to devolution of federal control of resources to the territories. (Devolution was completed in the Yukon in 2003, and is currently under discussion in both the NWT and in Nunavut.) A further challenge to northern resource management is the call from industry to ensure that regulatory systems are not overly complicated, since northern locations are already remote and isolated, with harsh environments and high extraction costs. By examining the history of resource development in the North, and comparing legislation across northern Canada, this research seeks to understand the nuances amongst the different regimes and the continuing evolution of resource management.

"MY RIVER, MY HOME" - A TESTIMONY OF THE FRASER RIVER THROUGH THE PERCEPTION OF CHILDREN.

Steven Marsh1, Shana Roberts2, Cherie Enns1, Bernhard Peucker-Ehrenbrink3,
Robert M. Holmes4
1 University of the Fraser Valley
2 Independent Consultant
3Woods Hole Oceanographic Institution
4 Woods Hole Research Center

In conjunction with research, on global river systems, being conducted by Woods Hole Oceanographic Institute researcher Bernhard Peuker-Ehrenbrink and Woods Hole Research Center Senior Scientist, Max Holmes, an art project evolved out of Max's research on the Lena River in Siberia that provided local students the opportunity to learn about what the river means to their community, how the system is impacted by human activity, global climate change, and how those impacts affect their community. Since the Fraser River is one being studied, the UFV had opportunity to collaborate with ten schools in the "My River, My Home" project. The art that was collected depicted spiritual, social, and environmental connections. At the heart of the project is not only the perception of the environment as seen through the children's eyes, but the importance of children's participation in the community and sustainable development. To include them into research within their community is to arm them with knowledge that enhances their ability to make better decisions for the future. Child participation is becoming one of the most legitimizing processes in social science fields because children are the future stakeholders. Child participation increases sense of connectedness to the environment and community and increases the ability to perceive real qualities of the world. They have the highest stake in the preservation of the environment for they will be bestowing it to the next generation, their children. It is through this diversity that the environment may be protected.

VARIATION OF FRASER RIVER, KANAKA CREEK AND SILVER CREEK GEOCHEMISTRY, BRITISH COLUMBIA

Steven Marsh1, Sharon Gillies1, Alida Janmaat1, Jenna Fanslau1, Bryce Downey1, Bernhard Peucker-Ehrenbrink2, Britta Voss2, Ekaterina Bulygina4, Gregory Fiske4, Timothy Eglinton2,3, Daniel Montluçon2,3, Helena Fraser2, Garrett Macklam-Harron2, Brayden Wiebe2, Michelle Martinec2, Carl Johnson2, and Scot Birdwhistell2
1 University of the Fraser Valley
2 Woods Hole Oceanographic Institution, USA
3 Eidgenössische Technische Hochschule, Switzerland
4 Woods Hole Research Center

As the threats posed by global warming rise it is becoming crucial to better understand the cycling of carbon within the Earth system. One aspect of this is to gain greater knowledge of the sources, pathways and timescales of river export of both organic and inorganic carbon from terrestrial surface to the oceans. Geography and Biology faculty and students at the University of the Fraser Valley have been provided the opportunity to collaborate with Woods Hole Oceanographic Institution and Woods Hole Research Center scientists through the time series analysis of geochemical parameters within the Fraser River basin. Samples have been collected at New Westminister and Fort Langley on the Fraser River, at Kanaka Creek in Maple Ridge and at Silver Creek in Mission since late 2009. These samples are analyzed for dissolved nutrients, major ions, 87Sr/86Sr and water chemistry parameters of dissolved oxygen, conductivity, temperature, pH, orp and turbidity were measured in situ with water quality sensors. A year of data is providing a greater understanding of the variation of the geochemistry of both the Fraser River and the two tributary creeks. This year will see an expansion of the sampling to two more tributary creeks and to an increase in the number of samples being collected. These two tributaries will provide an insight into the impact of agricultural activities and the impact of urban development on the variation of geochemistry of the tributaries.

THE HYDROLOGIC RESPOSE OF A SMALL FORESTED SWAMP COMPLEX

John E. Martin
Kwantlen University

Knowledge of runoff processes and hydrologic response is essential to understanding the role of wetlands within the larger environment. Small forested swamps are common in Coastal Western Hemlock (CWH) forests and represent an important habitat for birds, amphibians and larger mammals. However, hydrologic processes that generate runoff in these mineral wetlands are not completely understood. Hydrologic and electrical conductivity data were collected from a small forested swamp complex from July to November, 2009. Three large swamps occupied depressions between raised mounds and were connected by an ephemeral creek. Two hydrologic regimes occurred during the study period and different runoff processes dominated each regime. Runoff was generated by subsurface flow during dry summer months as swamps remained hydrologically disconnected from each other. During wet conditions in the fall, surface water expanded over swamps during intense rainstorms and runoff was generated by surface outflow from hydrologically connected swamps. The forested swamp complex produced a faster but limited hydrologic response during dry antecedent conditions compared to a slower but greater (up to two orders of magnitude) hydrologic response during wet antecedent conditions. Results suggest that these factors should be considered when designing monitoring programs or runoff models in CWH forest swamps with significant microtopography.

FOOD OR HOUSING? : AGRICULTURAL DEPLETION FROM A LOCAL PERSPECTIVE

Terri McCausland
Kings University College

For over a century geographers such as Von Thunen have recognized the impact land value has upon land use. While Agricultural Location Theory has been thoroughly criticized as simplistic, nonetheless as cities have sprawled outward and land values have increased farms have been transformed into subdivisions, shopping malls and industry throughout North America. In many cases farmers support this development and make considerable profit from the sale of their land. This poster portrays the conflict between food security and urban sprawl through the perspective of a retired farmer in Edmonton, AB who strongly opposes the development of agricultural land. Jim Visser farmed in the north eastern quadrant of Edmonton, which has a unique microclimate and rich soil, making it some of the most fertile agricultural land in Alberta. Jim is now a political activist working to protect agricultural land, enhance local food security, combat urban sprawl and resist industrial development as land values on farms increase.

SPATIAL (IN)EQUITY AND RESISTANCE: WASTE, EVERYDAY LIFE, AND 'THE MARGINS'

Hudson McFann
University of Toronto

Waste production, transport, and disposal have long contributed to the demarcation of certain places and peoples as 'marginal.' Through this paper, I discuss ways in which these interlinked processes may in turn generate opportunities for counter-practices, and perhaps counter-discourses, to emerge. I am specifically interested in how waste, and its (re)use through everyday practices, can function as a catalyst for a creative reimagining and reworking of socio-spatial relations. In this context, Michel de Certeau's distinction between strategies and tactics proves especially useful. While strategies involve exercises of power to delineate and claim ownership over particular places, tactics are the fragmented quotidian practices through which 'consumers' manipulate and subvert strategic order. Accordingly, I explore how strategies of waste production and management meet tactics of differentiated consumption, arising from everyday life in/of 'the margins.' Ultimately, I build this analysis to interrogate the concept of 'spatial equity,' placing it within the context of the everyday experiencing and reshaping of social space through tactics. In so doing, I work toward a clearer understanding of the concept's descriptive capacity, prospective applications, and geographical implications.

THE 'BODY' AS A SPACE: SKIN DEEP DESTINIES & THEORETICAL PARADOXES(?) OF HUMAN GEOGRAPHY"

Hollie McKeil
University of British Columbia

The process, by which the body is defined as a space, necessarily categorizes and therefore also controls, privileges and subordinates diverse groups of people. In the 18th century, the Cartesian 'mind and body' or the 'society and nature' dualisms have conceptually detached the intelligible, rational mind, from the useful body, and has since formed the groundwork for, but not limited to 'western' theoretical knowledges and everyday practices. In this way, the groundwork for two opposing definitions of the body; Essentialist claims grounded in scientific truths, whose objective methods have been given authority over subjective constructivist

knowledges. Moreover, this division reaches beyond the body and reflects 'cultural divisions' between the academic disciplines of the arts and sciences more generally.
There have been many attempts, particularly by feminist geographers to overcome this mind and body dualism through the integration of the corporeal body within social constructivist perspectives. However, most have, although admirably, merely revealed the social construction of the 'internal' biological body and therefore continue to perpetuate as well as remain embedded within the mind and body, or nature and social dualisms. The most established means to reject and reconstruct this deeply embedded dualism has been through Bruno Latour's Actor Network Theory (ANT). The power harnessed by the definition of the body in this method remains neglected and in turn has reproduced essentialist theoretical reductions it has attempted to overcome. The body therefore remains a 'sticky and slippery' space and a contemporary theoretical lacuna within the field of geography. How can we overcome the recurrent theoretical dilemmas without calling upon the dualistic social sciences categories, which define them? Perhaps more importantly however, is to further elicit the political implications of the rejection or transformation of these dualisms, that are most importantly, lived experiences that reach far beyond theoretical discussion. As C.P Snow powerfully articulates, "Is there no place where these two cultures meet?"

ENVIRONMENTALIST OR HUMANITARIAN?
Ginny McLane and Dr Pamela Shaw
Vancouver Island University

Life on our planet is comprised of a complex web of ecosystems in a harmonious balance, and it behaves mostly the way it has done over a geologic timescale. Humans, having inhabitated the Earth for a relatively short time have severely destabilized this balance, and anthropogenic climate change has upset a majority of the essential ecosystems around us. With our population nearing 7 billion and an increasing demand for food, fresh water and goods along with it, we risk losing our own habitat. But by maintaining healthy habitats of the diverse ecosystems around us, we stand a chance of saving our own place to live. The author focuses on climate change on a geologic time scale, possible past evidence of anthropogenic climate change and what we, as a human race, plan to do and are doing to save our own precious habitat, suggesting that education of all generations worldwide is the key to creating our own healthy habitat for the future.

THE ROLE OF PLACE PROMOTION AND URBAN IMAGE IN CITIES' DEVELOPMENT AND MARKETING OF RAPID MASS TRANSIT (RMT) SYSTEMS
Andrew McLellan and Dr. Damian Collins
University of Alberta

Cities have often competed for industry, investment and people, but with the transition to an entrepreneurial style of urban governance, the tools, methods and measurements of success in this competition are changing. For many cities, it is a stated goal to move up in the 'urban hierarchy' and this is often associated with increasing economic prosperity and power. With entrepreneurial urban governance, the improvement or development of rapid mass transit (RMT) systems is becoming a priority for a number of cities throughout the world. A comparative study of Edmonton, Canada and Auckland, New Zealand was conducted to determine motivations for the contemporary development and marketing of RMT. Primarily through key informant interviews in each city, it was found that while RMT development is carried out with a focus on tangible local benefits, the underlying motivator that results in political and financial support is the urban image benefits associated with having a strong RMT system. In addition, municipal decision makers are very conscious of the ability to use RMT as a place promotion tool to attract not only economic development, but also a 'creative class' of citizens that will help increase their success in regional or global scale interurban competition.

MCNULTY'S AMERICA DEL SUR - VERANO 2010
Cheymus McNulty
Vancouver Island University

In the summer of 2010 I flew to Lima, Peru with the intent on visiting my Grandmother's family, and exploring my own roots, knowledge and experience. I had a four-month window and just over $5000 to make my way around Peru and potentially the continent. Spending only a week in the densely populated and smoggy city of Lima, I made my way through the Andes onto Cusco and Machu Picchu. From there I made my way to the highest navigable lake in the world, Lago Titicaca, and on towards La Paz, Bolivia. From the border of Bolivia I continued to the Wine district of Argentina, and then to the capital, Buenos Aires. From Buenos Aires, I went to Iguaçu, world famous waterfalls, rivaling if not overshadowing Niagara and dividing Brazil and Argentina. I continued into Brazil, seeing the mega cities of Sao Paulo and Rio de Janiero, and returned through Bolivia to Peru. The format is a photo-journal with focusing on political, socio-economic and geographical factors such as cultural phenomenons, feats of architecture, geo-

graphic wonders, anti-government/corporation protests, government and security force corruption and inefficacy, indigenous inequalities, language intricacies, ecological destruction and mismanagement, incredible population/demographic agglomerations, infrastructure feats and failures, the world cup, food, and other worldly experiences. Upon my return to Canada my studies were enhanced and my facts were reinforced. This presentation was originally for my Geography of Music class, but will be reformatted to be for a wider and more educated audience.

SPATIAL VARIABILITY OF WINTER SNOW ACCUMULATION IN THE OKANAGAN RIVER BASIN, BC

Tallina McRae, Dr. Fes deScally, & Dr. David Scott
University of British Columbia's Okanagan Campus

The Okanagan River basin in British Columbia's Southern Interior is a semi-arid catchment where only an estimated 15% of the basin averaged mean annual precipitation of 554 mm generates streamflow (Okanagan Basin Study, 1973). The vast majority of this streamflow is derived from high-elevation snowmelt during the spring freshet. Understanding of the spatial variations of winter snow accumulation and thus snowmelt runoff is essential given the pace of development and increasing water demands in the Okanagan River basin. The objective of this study was to find a pattern in the spatial distribution that can be explained by the geography of the basin. The geography of the basin suggests increasing winter snow accumulation with increasing latitude and elevation. This is tested using winter precipitation and snowpack water equivalent (SWE) data from 37 locations in the basin including ski resorts, BC Ministry of Environment automated snow pillow stations and manual snow courses, and Environment Canada climate stations. Initial results appear to support the hypothesized horizontal and vertical gradients of snow accumulation. Further analysis of the winter precipitation and SWE data is continuing using MS Excel, Google Earth and ArcGIS 9.3 as analytical tools.

VANCOUVER'S AURATIC GEOGRAPHIES: PHOTOGRAPHY AT THE VANCOUVER ART GALLERY

Jamison Miller
Simon Fraser University

In this paper I analyze the cultural, political, and socio-spatial processes at Vancouver's preeminent visual arts institution, the Vancouver Art Gallery (VAG), in order to illuminate how the institution promotes specific practices and representations of art in Vancouver. My central analytic is Walter Benjamin's theory of the aura, a conception of the waning unique and powerful socio-spatial presence of art. I utilize this analytic to respond to two questions. First, how do the gallery's photographic practices respond to the waning aura of art in the eras of mechanical and digital reproduction? And second, what is the role of the gallery in a city that is actively embracing the neoliberal ideology of "creative" urban and economic policy? Deploying a qualitative case study, this research exposes how the Vancouver Art Gallery functions in the contemporary socio-political urban landscape and how art both constrains and liberates the Vancouver Art Gallery's practices.

TRANS-BOUNDARY BIODIVERSITY GOVERNANCE IN COSTA RICA AND PANAMA'S LA AMISTAD PARK

Lauren Miller &Troy Abel
Western Washington University

Objectives. This project focuses on an analysis of governing assemblages involved in ecosystem management in a case study of conservation and management efforts in La Amistad International Park in Costa Rica and Panama. In this investigation I use Common Pool Resource (CPR) Theory to analyze the structures of governance of a bi-national park and its progress towards sustainability more than a decade after the decentralization of the national park system and creation of SINAC, (National System of Conservation Areas). Hypothesis. I expect to demonstrate that the governance of this Park is a defendable case study of successful common pool resource management, involving local and international cross-scale linkages, also known as "glocal" qualities of governance. Cross-scale linkages encapsulate two of Elinor Ostrom's eight institutional prescriptions for Common Pool Resource management that are analyzed in this study: (1) collective choice arrangements and (2) multiple layers of governance. Methods. I am conducting an exploratory case study using a qualitative mixed methods approach involving semi-structured interviews and content analysis. Discussion. Throughout Costa Rica's conservation history, there have been a variety of successes and struggles in park management (Basurto, 2008). This project looks at how diverse forces, both the global and local, produced in the present structure of governance at various sociopolitical and geographic scales in La Amistad and the success and challenges of this form of governance. The unique balance between the incorporation of outside knowledge, support and investment with local customs, traditions and economic vitality needs to be understood. La Amistad may present an exemplary example of a bi-national natural resource collaborative management that could provide insight into transboundary natural resource management approaches.

STRUGGLES WITH MY HISTORICAL ATLAS OF MEDICINE HAT: PLODDING PROGRESS, PROBLEMATIC PATRONAGE AND PERSONAL PROBLEMS

Ben Moffat
Athabasca University and Medicine Hat College

Three and a half years ago I began a project quite different than the one that presently consumes my non-teaching hours. Medicine Hat, Alberta –an oasis-like prairie city of approximately 70, 000 – has, since 1967, had two-year, transfer-oriented university programmes. This has led to a situation where a significant body of academic literature simply does not exist. Aridity describes both the city's natural and historical research environment. In this milieu I have been attempting to research, write and create both a virtual and "coffee table" historical atlas. This paper relates some of the complications, hurdles, obstructions, pitfalls, frustrations, hazards, snags, impediments, setbacks, puzzles, entanglements, issues and situations that I have leapt, encountered and continue to fall over.

FIRST NATIONS VALUES AND GOALS IN PROTECTED AREA GOVERNANCE

Grant Murray and Leslie King
Vancouver Island University

Over the past few decades there has been increasing attention paid to 'alternative' forms of governance and to the creation of new protected areas that are designed to address 'non biological' goals and values. This has been evidenced in a number of international fora (e.g. the Durban World Parks Congress) and in on-the-ground initiatives around the world. The rationale for these initiatives has, in part, been based on the belief that well-designed systems of PA governance will help to deliver desired outcomes and meet linked socio-cultural, economic and environmental objectives. Yet this has been an under-researched area, and there is a relative lack of explanation as to how governance systems can are designed to reflect the social and ecological values and goals of various actors, as well as how those governance structures and processes result in particular desired outcomes. Addressing these questions has become increasingly important in British Columbia, where a number of First Nations are asserting increasing control over existing protected areas, as well as establishing new protected areas (managed exclusively by a First Nation). In both cases, First Nations are designing governance systems that attempt to deliver outcomes consonant with cultural beliefs, values and goals. This paper reports on an in-depth case study examination of the Tla-o-qui-aht Tribal Parks and the Pacific Rim National Park Reserve. Specifically, we examine how First Nations' values and objectives are (or are not) reflected in the governance of these two PAs. We will also build in comparative examples, including Gwaii Hanaas Nisga'a Lava Beds and First Nations forestry enterprises in Northern BC (eg. Tl'azt'en Nation Teeslee Forest Products). For each, we conclude with a discussion of the relationship of these outcomes to emerging literature and concepts of institutional design for improved protected area governance.

THE POTENTIAL OF MULTIDISCIPLINARY APPROACHES TO ANALYSING AND DESCRIBING PLACE

Kim Naqvi, Tom Waldichuk, Ila Crawford, Lyn Baldwin, Ginny Ratsoy, Elizabeth Templeman, Tina Block, Lisa Cooke
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Place-based studies are increasingly recognised as a means of strengthening both student engagement, and the analysis of complex personal, social, and natural relationships. In preliminary explorations of a place-based curriculum, geographic approaches to studying place were contrasted with experimental approaches in the visual and written arts, and plant ecology. Geographers examined the generic landscape of the big box store through changing human-land relationships, social conflicts over urban planning goals, and the material and symbolic dimensions of production and consumption. These revealed a complex palimpsest of physical and social processes which underlie the visible, apparently generic, landscape. Using a place-based approach drew students more deeply into the analysis, contributing their personal experience and expertise, and encouraging further personal investigation. The geographical analyses are compared with the results of three very different methodological approaches from the visual arts, creative writing, and a non-traditional method applied in plant ecology. Each demonstrates new dimensions of the definition and creation of place, as both a cultural and a material phenomenon. Interdisciplinary approaches are found to enhance geographical methods of identifying and describing "place" by emphasising its role as part of the human experience.

AN ANALYSIS OF THE CULTURAL AND ENVIRONMENTAL SIGNIFICANCE OF URBAN GREEN SPACES: NANAIMO, B.C.

Nielsen, Angie
Vancouver Island University

With modern planning and development of urban landscapes, there has been an increased recognition for the cultural and environmental significance that green spaces contribute to communities. Nanaimo, B.C., residing on Vancouver Island, has high per-

centage of urban green spaces such as parkland, community gardens, recreational spaces, green corridors, nature reserves and indigenous forests. These natural landscapes can act as sanctuaries within an urban setting, places for community involvement, which promote values of environmental stewardship and education. They can improve transportation and interconnectivity within the city. Furthermore, they encourage citizens to become more active by providing more pedestrian and cyclist oriented pathways. Urban green spaces also contribute to the environmental sustainability of a region. They provide areas of permeability for aquifer regeneration, carbon sinks to improve air quality, wild life habitat and general ecosystem health and biodiversity. Through the management of urban green spaces there are some important factors to be considered such as wildlife and human interactions, safety and security, and issues surrounding urban densification and escalating land values. Though incorporating more green spaces within urban settings contributes to overall healthier sustainable planning for members within a community and of local environmental systems. Nanaimo's urban green spaces encourage healthy lifestyle values, a greater sense of community, and lower the overall environmental impact.

COOPERATIVE RECYCLING: EQUITY, EMPOWERMENT, AND THE REINSCRITION OF GENDERED DIFFERENCE

Neil Nunn and Jutta Gutberlet
University of Victoria

This study is about the relationship between gendered bodies and the spaces of a group of worker's recycling cooperative in the ABC region of São Paulo, Brazil. In this study I argue that the recycling cooperative is a uniquely inscribed landscape that neither fits clearly into the category of male or female and a space where individuals who have traditionally lacked access to power are granted the opportunity for empowerment. I explore the steps that this space is taking towards deconstructing the meaning placed on categories of male/female and the power configurations enmeshed with these categories. I elucidate this argument by posing two questions. First, in what ways has the recycling cooperative fostered empowerment and allowed for women to inspire personal and social change, and have the power to influence institutions that affect their lives? Second, what institutions have significantly influenced the adoption of the salient values of community, solidarity and equity within the cooperative? Because of the way such values discursively shape the space of the recycling cooperative, this study describes the way that individual and collective identities are and continue to be liminally shaped.

THE SCIENCE OF GRIZZLY BEAR POLITICS AN ENVIRONMENTAL ASSESSMENT CASE STUDY

Cameron Owens
Simon Fraser University

BC's environmental assessment (EA) process has come under intense criticism in the wake of a number of controversial project approvals. EA is a comprehensive planning technology used to identify and minimize the adverse impacts of major developments. Central to BC's efforts at sustainability, EA provides recommendations to government decision-makers based on a synthesis of technical scientific study, public, First Nations and other stakeholder input and professional judgment. While portrayed as technical, neutral and objective, critics have asserted that the process is a deeply flawed, thoroughly politicized exercise in rubber-stamping business-as-usual.

This paper disseminates findings from a detailed study of the controversial EA approval of Jumbo Glacier Resort, a major development proposed for an uninhabited valley in southeastern BC. In particular, it focuses on one of the central issues of this case: the potential impacts on grizzly bears. Using a Foucault-inspired governmentality analysis, I investigate the production and contestation of knowledge about the status of grizzlies in the area, potential impacts on them and the efficacy of proposed mitigation measures. I conclude that while declaring the process a rubber stamp is an oversimplification, the production of scientific knowledge and assessment is inescapably political.

THE URBAN GEOGRAPHY OF WASTEWATER IN MEXICO: A COMPARATIVE ANALYSIS WITHIN THE LERMA-CHAPALA RIVER BASIN

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Mexico's water stress index is one of the highest worldwide, and the highest in North America. It's no surprise thus that water scarcity ranks high in priority levels when it comes to water-related social science scholarship. Given that wastewater is part of the hydrological cycle, it is perplexing to see little attention being paid to the politics and urban geography of polluted effluents' management. This paper uses empirical data from a cross-regional analysis of wastewater policies in five Mexican states whose territory is embedded within the Lerma-Chapala watershed to shed light on the complex network of cross-jurisdictional linkages and policy interactions around wastewater governance. Variations in state wastewater policies are explained using an analytical framework

founded on a neo-institutional study of rules, norms and interactions within the watershed council governance framework. The paper illuminates the complexities inherent to the politics of wastewater management in diverse urban habitats and provides fertile ground and a foundation for future research on the limitations of the river basin council model for water and wastewater governance.

UNDERSTANDING INDUSTRIAL AND URBAN RESTRUCTURING TRAJECTORIES USING FIRM DEMOGRAPHICS AS A METHODOLOGICAL TOOL: A CASE STUDY OF THE MEXICAN LEATHER AND FOOTWEAR CLUSTERS

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Traditional theories of industrial restructuring assign the most explanatory weight of the structural change phenomenon to increasing pressures via globalization and falling trade barriers. My research offers a new model of thinking about industrial restructuring that includes multiple stressors. The analysis focuses on three main drivers of structural change: market pressures, environmental regulation and changes in land use and land pricing, using two case studies of leather and footwear industrial clusters in Mexico, located in the cities of León and Guadalajara. Evidence of multiple drivers of structural change is found. Furthermore, responses to restructuring drivers in León and Guadalajara are found to be substantially different. In this talk I focus primarily on the environmental implications of different zoning policies and land prices on the restructuring trajectories of both case studies.

CANMORE AND BANFF CEMETERIES: A NECROETHNIC STUDY

Anne-Marie Paquette
University of the Fraser Valley

Banff and Canmore Alberta were established by the railroad in the 19th century, both have equally beautiful settings, but one became a world renowned tourist destination and the other a working man's town. Why this happened is because of coal and hot springs but who was there to make it happen is the purpose of my research. After site visits to the cemeteries to collect data and photographic information I began my background research into the archival records of the communities' cemeteries. Both cemeteries have records available from their founding in the 1890's. Further research into the UFV necro-ethnicity library helped to interpret the symbolism and language on the grave markers. I continued to research the historical nature of the two communities to draw conclusions on the reason for immigrants to settle and die there. What I found was the majority of persons buried in Banff are either coal miners from Bankhead or persons of Anglo-Saxon heritage, well educated professionals, and aristocrats. While those in Canmore were predominantly immigrant coal-miners and some founding ranch families. This is supported by the historical beginnings of both communities; one to mine coal for the trains and the other to entertain wealthy train travellers.

THE MANAGEMENT OF WATER QUALITY IN BRITISH COLUMBIA AND NEWFOUNDLAND & LABRADOR

Jackie Peat, B.A., and Marilyn Tse
University of British Columbia

This project evaluates how the quality of water is managed and governed in two Canadian provinces on opposite sides of the country. While we recognize that the threats to the quality of water in the two are not entirely analogous, and that there are inherent differences due to disparities in size and geography, it is interesting to juxtapose how the various stakeholders are approaching the issues. Despite the presence of some federal authority, most water management falls under provincial jurisdiction. The Canadian Constitution gives the provinces proprietary rights and, as resource owners, extensive management authority over water found within their borders. However, the impact of water quality extends far beyond administrative policy, with stakeholders in government, the public, industry, First Nations, and NGOs. Our research attempts to explore the distribution of responsibility in British Columbia and Newfoundland & Labrador, how it was established, and how it is perceived by the parties involved. Doing so gives insight into the current system of provincial water quality management within a larger national framework, setting the stage for further assessment and opportunities for improvement.

INFORMED CONSENT AND CANADIAN MEDICAL TOURISM WEBSITES: ASSESSING A PRIMARY INFORMATION SOURCE FOR MEDICAL TOURISTS

Kali Penney, Jeremy Snyder, Valorie Crooks, Rory Johnston
Simon Fraser University

Background: Medical tourism is growing increasingly popular with Canadian patients and many of them are using the services of a medical tourism broker to plan their procedure abroad. Brokers' websites serve as an important source of information for poten-

tial medical tourists and are highly influential in shaping first impressions of this practice. We were interested in examining the brokers' websites in order to assess the quality of information being communicated to potential patients. Methods: We identified 17 medical tourism brokers across Canada and performed a thematic content analysis of their websites. We focused our analysis on 4 main areas: training and accreditation, terminology, risk communication, and business dimensions. Results: Training and accreditation varied extensively, and it was often difficult to discern from the website whether or not the physicians abroad and the hospitals they worked in were competent. The brokers were often members of organizations, such as the Medical Tourism Association (MTA) but were rarely accredited. The terminology used varied between websites, with the term 'broker' being avoided unanimously, usually in favour of the term 'facilitator' but occasionally replaced by other alternatives. In general, we found brokers reluctant to discuss, or even mention, patient risk on their websites. Discussion of follow-up care was also uncommon and often unclear. Conclusion: We conclude that there is a need in this industry for greater regulation and standardization, both of the brokers themselves as well as the hospitals they partner with. A lack of clear risk communication combined with some informational gaps in the brokers' websites could ultimately be compromising a patient's ability to make informed choices regarding their care and to give informed consent to medical procedures.

EXPLORING THE NORTHERN EXTENT AND PUTATIVE DRAINAGE ROUTE OF GLACIAL LAKE KOOTENAI IN THE KOOTENAY VALLEY, BC: PRELIMINARY FINDINGS

Jared Peters and Tracy Brennand
Simon Fraser University

At last glacial maximum the Purcell lobe of the Cordilleran Ice Sheet (CIS) dammed glacial Lake Missoula. This lake drained and filled numerous times as the Purcell lobe decayed, forming the spectacular landscape of the Channeled Scablands, WA. Further melting and northward retreat of the Purcell lobe resulted in the formation of glacial Lake Kootenai (gLK): a large proglacial lake that drowned an area of 690 km2 – 1,243 km2 in Idaho and Montana. However, the extent of the lake north into Canada is not well known. Recently, it has been proposed that failure of the northward retreating ice dam lead to a jökulhlaup down the West Arm of the Kootenay valley, BC, which resulted in the final catastrophic drainage of (gLK). These floodwaters have been invoked to explain low terraces along the Columbia Valley in Washington State. Here, we document geomorphological and sedimentological evidence for the northern extent of gLK, and explore the possibility of a northern flood route.
Preliminary analyses reveal the extension of the gLK lakebed as far as 17 km north of the international border into the Kootenay valley in BC. Further north, elevated ice contact gravel, sand, silt and clay in kame terraces suggest an ice lobe in Kootenay valley acted as a northern ice dam. Also, thick and elevated gravel deposits associated with high discharge waters originating in the Purcell Trench have been found in the West arm of the Kootenay valley. Whether these deposits originated during the catastrophic draining of gLK requires further analysis.

DIVING FOR GIANTS: A DENDROLACUSTRINE INVESTIGATION IN THE BELLA COOLA AREA, BRITISH COLUMBIA

Pitman, Kara and Smith, Dan
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High elevation lakes and ponds in coastal British Columbia are ideal sites for preserving submerged logs. The cold water characterizing these settings reduces anaerobic activity and ensures that logs sinking to the lake bottoms retain their structural integrity. Previous research shows that subfossil wood remains exist on the bottom of most lakes surrounded by ancient forests. The intent of the research was to extract these wood samples from the high elevation lakes in the Bella Coola area of the central British Columbia Coast Mountains. The expectation was that the remains of trees found on the bottoms of these lakes would contain tree-ring series extending further back in time than those contained within nearby living trees. In the summer of 2010, scuba divers extracted submerged logs from M Gurr and Blue Jay lakes in the Clayton Fall Conservancy. Floating chronologies were created and cross-dated to living tree-ring chronologies with the intent of creating a supra-long chronology useful for providing a multi-century perspective on regional climate dynamics.

URBAN ENTREPRENEURSHIP AND THE VANCOUVER 2010 WINTER OLYMPIC GAMES

George Rahi
University of British Columbia

Various strategies of entrepreneurial urbanism are highly visible in recent changes to Vancouver's urban fabric in the run-up to the 2010 Winter Olympic Games. Using case studies of the Vancouver Convention and Exhibition Centre and Olympic Village, this paper posits that these mega-projects exemplify an updated conception of 'urban entrepreneurialism'. In examining the economic rationales behind these projects, this paper seeks to account for disconnects between the re-imagining strategies of entrepreneu-

rial urbanism and the broader concerns of the social landscape. How have these large-scale physical interventions in the city structure ideas about the objectives of the future city of Vancouver, and in doing so, what other visions become excluded?

PLANT-POLLINATOR INTERACTIONS AT ALEXANDRA FIORD, NUNAVUT

Robinson, Samuel V.J. and Henry, Greg H. R.
University of British Columbia

High arctic plant-pollinator interactions are, in general, poorly understood. As the high arctic is predicted to be one of the most strongly affected biogeoclimatic zones in the next 50 years, understanding these interactions is important in determining ecosystem responses to climate change. Observations took place in July 2010, at Alexandra Fiord, Nunavut, Canada, and consisted of direct observation of plots of flowering Salix arctica, Dryas integrifolia, and Papaver radicatum. Visiting insects were categorized into families, and visitation was compared between species of plants. Bumblebees (Bombus spp.) and Butterflies and Moths (Lepidoptera) were found to play a minor role in pollination, while flies (Dipterans) were shown to be the major pollinators. Of the Dipterans observed, the Syrphidae tended to be generalists, while Muscidae tended to visit Papaver radicatum. This may be due to Muscidae undergoing thermoregulation by basking in the corolla, while Syrphidae focus more on nectar-gathering from Dryas integrifolia and Salix arctica.

DEVELOPING THE NEXT GENERATION OF COMMUNITY-BASED RESEARCHERS: A STUDENT WORKSHOP

Laura Ryser1, Greg Halseth1, and Sean Markey2
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Funding agencies are increasingly calling for collaborative research between community partners and academics. These collaborative frameworks often present a challenge to student research activities – both in terms of researcher training and timelines. The quality and effectiveness of student research experiences, however, will have longstanding impacts on their future research careers, as well as repercussions pertaining to the community experience with the research process. The purpose of this workshop is to provide students with information about how to get the most out of their research experience. Key topics to be addressed include finding community research opportunities, identifying what you should know and what you should ask before engaging with a research team, how to obtain a breadth of research skills and experiences, researcher etiquette and demeanor in the community, budgeting, time management, and developing future research and employment prospects.

PLANNING ECOLOGICAL RESTORATION FOR RUBBER PLANTATIONS: INSIGHTS FROM POLITICAL ECOLOGY AND FARMERS' PERSPECTIVES IN XISHUANGBANNA, CHINA

Noah Schillo
Simon Fraser University

The severity of tropical forest loss from land use changes is increasing governmental and scientific emphasis on ecological restoration. All too often, however, restoration research and planning fails to address local customary institutions and practices, thereby limiting the success of projects along with jeopardizing extant social and ecological conditions. These pitfalls draw attention to the utility of political ecology for benefitting restoration planning and praxis. To this end, my research examines prospective ecological restoration in southwest China where vast monoculture rubber cultivation throughout Xishuangbanna Prefecture has led to alarming ecological changes. The Prefectural government and state scientists have begun planning for "environmentally-friendly rubber plantations," but the views of local resource users remain neglected. This study involves a multi-sited ethnography and participatory mapping to gain the perspectives of minority nationality farmers implicated by the plans. A political ecology analysis yields insight into possibilities and constraints surrounding restoration in Xishuangbanna. The results highlight varying scales of social relations embedded in land tenure and the significance of intersecting cash crop economies. Such considerations present a broader scope for advancing the field of restoration ecology.

DENDROCHRONOLOGICAL RECONSTRUCTION OF RECENT FIRE EVENTS NEAR BURNELL LAKE IN THE SOUTHERN OKANAGAN, BRITISH COLUMBIA

Alanna Schuurmans and Jonathan Hughes
University of the Fraser Valley

This study provides preliminary insight into past fire-disturbance regimes in ponderosa pine (Pinus ponderosa)-dominated forests surrounding Burnell Lake, which is located west of Oliver, British Columbia. During May 2010, targeted sampling was implemented

within the Burnell Lake watershed to retrieve wood samples from fallen logs, standing snags, and live trees. A total of 64 increment cores and 15 cross-sections were collected, building on previous sampling efforts in 2005. Results consist of 26 fire-scarred ponderosa pine and Douglas-fir (Pseudotsuga menziesii) samples yielding over forty separate fire events that occurred from 1658 to 2009. Our findings suggest that prior to the practice of fire suppression, the occurrence of forest fires within the Burnell Lake watershed was more frequent and commonly of fairly low-intensity, which we infer by the low degree of tree mortality and subsequent formation of cambial scars. In contrast, the most recent fire in 1969 was unprecedented in its extent and severity. Results from this study suggest that fire-suppression alters the natural fire regime around Burnell Lake by lengthening the time between fires, which likely increases the probability of extreme fire events.

JOINT MANAGEMENT IN PROTECTED AREAS: WHAT IS IN IT FOR FIRST NATIONS IN BRITISH COLUMBIA?

Julia Schwamborn
University of Northern British Columbia

In an environment of tri-partite treaty negotiations and the provincial government's "New Relationship" policy, First Nations in British Columbia are exploring numerous avenues of regaining control over their territories. This paper explores First Nations' opportunities in managing protected areas under joint management contracts with federal and provincial governments. The two main examples analyzed as to their potential benefits for the involved First Nations are the Gwaii Haanas National Park/Haida Heritage Site as an instance of cooperative management with the federal government and the Kitlope Heritage Conservancy as an example of collaboration between a First Nation and the provincial government. The analytical framework is based on definitions of indigenous rights and on a number of common indigenous concerns as found in contemporary indigenous and non-indigenous literature. Management plans and other available documentation and commentary related to the two study examples are analyzed with regards to their potential for addressing indigenous concerns and their respect for, and incorporation of, indigenous rights. While not an ultimate solution to every problem, joint management of protected areas offers a variety of opportunities and interim solutions. The success and potential, however, are highly dependent on the established relationship between a First Nation and a government agency as well as the levels of true First Nation decision-making control within an agreement or management plan.

SOLAR RADIATION OBSERVATIONS IN THE SOUTHERN COAST MOUNTAINS OF BRITISH COLUMBIA

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Solar radiation is often the dominant source of energy at the surface of a melting glacier. While solar geometry can be used to estimate potential direct solar radiation, clouds and atmospheric constituents will impact observed solar radiation totals over short distances, particularly in mountain environments. At the site scale, a single reference station with observations of incoming solar radiation is sufficient for modeling glacier melt. At regional scales, however, use of a reference station may introduce large errors in estimated solar radiation and melt. In this study, hourly and daily observations of solar radiation obtained from four mountain sites in the southern Coast Mountains of British between 2006 and 2008 are examined. Results indicate that at distances greater than 30 km, extrapolating observations of incoming solar radiation will incur greater errors versus the use of transmissivity models and estimates of potential solar radiation. Particularly on hourly timescales, variability in cloud cover between sites creates large errors if solar radiation is extrapolated from a single reference station.

COMMUNITY-BASED ECOTOURISM IN GHANA: THE QUANDARY OF THE BOABENG-FIEMA MONKEY SANCTUARY

L-A Shibish
Vancouver Island University

Historically government imposed conservation models have negatively impacted local communities. In countries such as Ghana, pressing social-economic issues often are at odds with conservation goals. In searching for solutions to the poverty-conservation nexus ecotourism development can be seen as a palatable compromise for encouraging community participation in habitat and biodiversity preservation. There is an emerging model of community-based conservation using ecotourism development to provide local benefits. This paper reports on a 3 month examination of the ecotourism business at the Boabeng-Fiema Monkey Sanctuary in Ghana, West Africa. The research took the form of participant observation, secondary data review, and informal interviews. While the sanctuary has been able to generate considerable domestic and international recognition, as well as substantial income flow it has also lead to difficulties and challenges. One of the major challenges has been in the equitable and transparent distribution of the benefits derived from the tourists which is eroding local support for the conservation efforts. Another has been in managing the increasing incidents of human-wildlife conflict in the absence of educated staff. Drawing on contemporary ecotourism develop-

ment knowledge the paper concludes with recommendations for the sanctuary. These recommendations include education about, and implementation of accepted administration practices; engagement with academics to expand local knowledge regarding wildlife behaviour and management practices aimed at reducing human-wildlife conflict; employee development; and complimentary tourism products and services that link the fringing communities for flow of benefit.

LANDSCAPES OF DRAG: PERFORMATIVITY AND COMMODIFICATION OF THE CULTURAL LANDSCAPES IN VICTORIA'S CHINATOWN

Andrew Shopland
University of Victoria

Since its revitalization in the 1980s, the cultural landscape of Victoria's Chinatown has become increasingly commodified. With this specific landscape growing out of a complex and oppressive history of colonial, intercultural interactions, the added layers of commodification and historic preservation result in an extremely multifaceted landscape. Examining landscapes from my position as a queer geographer and through the lens of performativity, I find that the landscape itself has the capacity to perform identity. In the case of Victoria's Chinatown, increased commodification has resulted in a new identity being performed in the landscape. This new identity is an exaggerated caricature of a historic landscape: 19th-century Chinese-Canadian neighbourhood drag.

THE INFLUENCE OF DISCHARGE ON HYPORHEIC EXCHANGE IN A SMALL URBAN STREAM

Jacquelyn Shrimer and Ilja Tromp-van Meerveld
Simon Fraser University

The hyporheic zone is a hydrologically, biologically, and chemically distinct area between the stream and the surrounding area in which the exchange of water and dissolved material occurs. It has significant effects on biotic processes, is a preferred salmon spawning habitat, and is a natural filter for effluents, contaminants, and nutrients. Hyporheic flow occurs horizontal beyond the stream and vertical beneath the stream. Longitudinal exchange takes place through riffle and pool sequences in a stream, which are associated with streambed complexity. Head gradients are the driving force behind hyporheic exchange. A number of factors influence the extent of the hyporheic zone and the rate of hyporheic exchange. These include discharge, topography, and geomorphology. However, previous studies have yielded inconsistent results regarding how discharge influences the hyporheic zone and hyporheic exchange.
Most studies on the hyporheic zone have been conducted in forest streams or flumes; very few have looked at the hyporheic zone in urban streams. The objective of this research is therefore to provide a better understanding of hyporheic processes in a coastal urban stream, and how discharge and geomorphology affect it. This presentation will provide a background on hyporheic exchange, and discuss the methods carried out to collect data in Hoy Creek, Coquitlam, B.C. Additionally the effects of discharge on hyporheic exchange during low and high flow conditions between July and December 2010 will be discussed.

RENOVATION PROFITABILITY: AN ANALYSIS OF BUILDING PERMITS AND PROPERTY VALUES IN OAK BAY, BC

Tye Shutty
University of Victoria

In 2009, Canadian repair and improvement expenditure on housing surpassed spending on housing construction for the first time. Renovation is popularly seen as a way to increase house value, but rarely provides a complete return on investment. Building permits and property assessments between 2005 and 2009 were recorded to study the impact of these wider trends in Oak Bay, BC. Over the complete data set, there is no correlation between increased renovation spending and increased building value. Further analysis speculates about the influence of land value, location of street, use of a contractor, age of building and date of renovation on building value. Other variables, like the type of renovation, are analyzed. The BC assessment evaluation process is studied. Personal value and unique home buyer evaluation add to the influencing variables not touched on in this study. The data are not normally distributed or randomly selected, but still offer locational insights and potential transferability. In exploring the relationship between renovation and building value, this study reveals multiple influencing factors on and results of the renovation economy and culture in Oak Bay.

FIREARMS: A CROSS BORDER STUDY OF LAWS AND REGULATIONS

Alexander Smalldon, Owen Whitcomb
Western Washington University

The great ease in the availability and distribution of firearms in the United States has resulted in the widespread ownership of handguns, shotguns, and rifles by the American populous. It is believed this unrivaled lawful access to firearms has lead to higher

rates of firearm related crimes per capita in the U.S. when compared to Canada. This study compares the current legal structure, regulations and constraints between Canada and the United States pertaining to the sale and distribution of personal firearms. The availability of firearms, whether legal or not, between these two countries will be assessed to reveal if a relationship between level of firearm regulation and incidence of criminal activity involving firearms is present. Primary statistical data and secondary data are used to assess this relationship. Additionally the possibility of a Border Paradox exists due to contradicting international legal structures, leading to a thriving illegal market in Canada for U.S. based firearms. Finally, the possibility of increasing trends of firearm related crimes in Canada and the resulting effects to regulations in either country is explored.

THE BENEFITS OF NON-VISUAL MAPPING FOR INDIVIDUALS AND COMMUNITIES

Cail Smith
University of Victoria

Maps are not neutral objects but conceal norms and values including the cultural dominance of sight. This presentation will review maps created by geographers and artists which move beyond the visual paradigm in cartography. The maps are classified based on their representation into static and dynamic forms. They ask users to draw on their other four senses (smell, taste, touch, and hearing) to (re)orient themselves. Examining qualitative and quantitative research on the links between emotion, memory and the non-visual senses, this presentation will put forward suggestions for positive benefits that could arise for individuals and communities who participate in a non-visual mapping process.

STEMFLOW IN A MATURE COASTAL BRITISH COLUMBIA FOREST

Sheena A Spencer and Ilja Tromp-van Meerveld
Simon Fraser University

Stemflow is the portion of precipitation that falls on a forest canopy and flows down tree stems, increasing the amount of water that reaches the forest soil at the base of the trees. The amount of precipitation that reaches the ground as stemflow varies greatly depending on a number of factors, such as plant morphology, precipitation intensity and duration, and wind direction. Many studies have shown that stemflow can make up 0.5 – 28% of the gross incident precipitation and up to 45% for desert shrubs. Previous research in the Malcolm Knapp Research Forest has shown that funneling ratios range from just above zero to less than 3.0 for the study site. However, species specific funneling ratios were not reported. It is important to study multiple trees of each tree species within a forest to gain a more accurate representation of the variation in stemflow. This presentation will focus on stemflow variation among four tree species in a mature coastal British Columbia forest and how it is affected by basal area, total precipitation, and tree species. The relationship between stemflow intensity and precipitation intensity will also be discussed.

350-YEAR DENDROHYDROLOGICAL RECONSTRUCTIONS FOR TWO NIVAL BASINS IN WEST CENTRAL BRITISH COLUMBIA

Colette Starheim, Dan J. Smith, and Terry Prowse
University of Victoria

Nival-regime basins provide essential freshwater resources for many coastal and interior communities of British Columbia. Melt-season discharge for these basins is naturally variable and largely dependent upon patterns in synoptic ocean and atmospheric climate forcings. As low-frequency change is characteristic of several important climate oscillations affecting British Columbia, it is necessary to understand both the short and long-term behaviour of our river systems. Unfortunately, the short length of hydrometric records in this area typically constrains our understanding of discharge variations to the past century. Annually-resolved tree ring-width and ring density measurements provide an opportunity to extend instrumental records and gain insight into paleo-discharge dynamics. Recognizing this, a regional multi-species network of hydroclimatically-sensitive tree chronologies was constructed from sites in west central British Columbia. Proxy records of July-August mean discharge were constructed for the Skeena and Atnarko basins. Supplementary tree-ring models of summer temperature anomalies and end-of-winter snow water equivalent records are also provided to gain additional insight into the long-term climate drivers of these river systems. Links to the Pacific Decadal Oscillation and the Pacific North America pattern are discussed.

MAKING THE INVISIBLE VISIBLE: A NEW CARTOGRAPHY OF THE STONEY NATION IN KANANASKIS COUNTRY, ALBERTA.

Paul Stephany
University of the Fraser Valley

Indigenous cultures in Canada have a long history of being excluded and driven out of their traditional land areas due to colonization and encroaching settler societies. Our European-based culture has been in conflict with native cultures ever since explorers

first began to map and colonize the land we now call home. In a sense, indigenous groups have been made largely invisible through modern treaty process and land question issues. The purpose of this paper is to demonstrate how oral narrative, place names and indigenous way-marking systems can be used to recreate historic native territories and create a new cartographic representation of native presence in Canada.
By focusing on local narratives and historic way-marks, the author will map the historic presence of the Stoney Nation in the area we now call Kananaskis Country; a region in which this group has long been made invisible. This study utilizes methodologies used by contemporary ethnographers and anthropologists, including Dr. David Shaepe (A Coast Salish Historical Atlas), Hugh Brody (Maps and Dreams) and Dr. Ken Brealey, whose PhD dissertation influenced his current land claims work. Written narrative, petroglyphs and geographical landmarks in Kananaskis will be utilized to create an ArcGIS map and discussion of historic native presence and territory from which the Stoney have long been "mapped out". This presentation is intended to begin the author's journey into a larger project to map the Stoney Nation "back" into Kananaskis Country, Alberta.

VANCOUVER: A URBAN HABITAT FOR FARMING
Sharla Stolhandske
Simon Fraser University

There is a new generation of urban agriculture growing in the back alleys, front yards and rooftops of the urban realm in North America. The products are displayed on farmers market tables and in the local fare of restaurants, and may have only travelled a few hundred metres from garden to plate. Labelled urban farming, this modern urban agriculture industry has begun to tap into the economic potential for local, organic food. In Vancouver, urban farming contributes to the social, economic and ecological diversity of the urban realm. Growing urban food for market has the same social, health and ecological benefits as recreational urban agriculture. In addition, this industry provides new jobs and stimulates the local economy. An ethnographic study of six urban farmers growing food in Metro Vancouver reveals that the act of growing and marketing food in the city's urban core is an expanding and dedicated business. The study focused particularly on the newly emerging highly urbanized farming enterprises in the Vancouver area. Urban farmers are embedded in the community as land stewards, local suppliers of weekly vegetable subscriptions and educators. The organic and small-scale planting techniques of these urban farmers combined with the local marketing venues have a light ecological footprint. While not a lucrative industry, urban farming proves to be a formidable lifestyle choice, with several non-monetary benefits. Most importantly, this study provides the first baseline data and theory regarding the extent and viability of this emergent type of commercial urban agriculture in Vancouver.

SOCIAL AND HEALTH VULNERABILITY TO EARTHQUAKES IN THE CAPITAL REGIONAL DISTRICT, BRITISH COLUMBIA CANADA
Sarah Stoner and Denise Cloutier-Fisher
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Objective: The primary goal of this research is to identify social vulnerabilities and resiliencies to earthquake hazards within the Capital Regional District (CRD) and to generate recommendations for how various local and regional government agencies can support the continued enhancement of healthy, disaster-resilient communities.
Methods: Quantitative and qualitative research methods were employed to evaluate social vulnerability and resilience. The combination of methods used provided a more comprehensive insight into where social and health vulnerabilities and resiliencies lie within the CRD.
Results: Twenty-five census tracts (CTs) within the CRD were found to display 'high social vulnerability'. Highly vulnerable CTs tend to cluster in more densely populated areas, whether they be inner city neighbourhoods or suburbs of the City. Qualitative results show that the population is generally very healthy, though there is the potential for severe psychosocial stress and increased mental health issues in the event of a large scale seismic hazard. From the attendance at focus group meetings and through the interviews it seems that there is a high level of complacency and a false sense of security, especially in Victoria—the urban core of the region. Sooke and Port Renfrew, rural and remote communities within the region, have demonstrated an intrinsic resilience through a high level of adaptive capacity to regular repeated disturbances, inconveniences and emergencies in those areas.
Conclusion: The information collected complements existing hazard maps and local knowledge well. This comprehensive vulnerability assessment can be used as a valuable tool in enhancing understanding of risk-assessment for the area.

LOOKOUT ARMAGEDDON: BATTLEFIELD TOURISM AND BLOOMING LANDSCAPE IMAGINATIONS OF CHRISTIAN ZIONISTS
Tristan Sturm
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In the American Christian Zionist imaginary of "Holy Land" landscapes, Tel Megiddo (Armageddon) and the Jezreel Valley that ex-

tends from it figure centrally in the production of an Judeo-Evangelical nationalism. Unlike other forms of battlefield tourism, Tel Megiddo is performed not as a place of a past heritage where heroes fought, blood was shed, and battles were won and lost, but rather as a battlefield of the future where the forces of good and evil will meet in the last battle to conquer the earth. The Judeo-Evangelical nationalism is performed here in the future tense by imagining the Jewish heroes who will fight, blood that will be shed, and where the final battle to end all battles will take place and be won. The Jezreel valley has been performed along side its apocalyptic future as having fulfilled the Jewish prophecy of making the "Land Bloom." The valley's agricultural success after Zionist immigration is interpreted both as justifying Jewish claims to territory and also as having fulfilled part of the apocalyptic prophecy that Jews will return to Israel and once again make it flourish. It is argued that these two seemingly distinct events, the past Jewish agricultural success of the Jezreel valley and the future battle of Armageddon, are connected through a present representation of landscape that sees the Jewish territorial presence on the landscape as portending the apocalypse.

NINE DECADES OF GLACIER CHANGE IN THE ROCKY MOUNTAINS, CANADA

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We calculated area, elevation, and volume change of glaciers in the Canadian Rocky Mountains from the 1920s to 2009. Inter-provincial Boundary Commission (IBC) maps of the Alberta/BC boundary, which were surveyed between 1903 and 1924, show glacier extent in the early years of the Twentieth Century. We compared the areas of the glaciers on these maps to those derived from aerial photographs flown between 1982 and 1987, and satellite images acquired in 2000-2002 and 2006. Over the 90-year period, the total area of glacier ice diminished by 680 km2 or 40 percent. Small glaciers lost a larger percentage of their areas than large glaciers. We conducted a more detailed analysis of the Columbia Icefield using IBC maps, eight sets of aerial photographs from 1948 to 1993, and satellite data from 1999-2001 and 2009. Over nine decades, the Columbia Icefield lost 60 km2, or 23 percent, of its area, 13 km3 of its volume, and thinned, on average, 50 m. The major outlet glaciers thinned by up to 250 m over this period. Glacier thinning and retreat slowed during the 1960s and 1970s, and a few glaciers that drain into the Columbia Basin thickened by 10-20 m near their termini. These changes coincide with cool, wet conditions during the 1960s and early 1970s. Terminal debris-covered ice thinned less than adjacent bare ice on the same glaciers.

MANAGEMENT OF SMALL WATER STORAGES: A CASE STUDY OF SMALL FARM DAMS IN NEW ZEALAND

Jan Thompson
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In agricultural areas of New Zealand, there are thousands of small dams (<4m height) that interrupt streamflow, primarily on first order streams. These small dams are used as water storage reservoirs for livestock use or irrigation during dry periods. However, little is known about the impact of these dams in terms of water quantity, quality, sediment transfer, and stream morphology at both the local and regional scale.

A combination of field-based methods and modelling was used to quantify the overall impacts of farm dams on the downstream system in an agricultural catchment in New Zealand. Results show that farm dams reduced overall discharge and flood peaks, but winter high flows became more continuous. Water quality was degraded and sediment transfer decreased as a result of the dams, with aggradation occurring in downstream channel reaches.

Results of this study will point to effective strategies in the management of small water storages in New Zealand. Results will also be linked to British Columbia, where the intensification of water use has led to water shortages in some regions, and the subsequent promotion of water storage as a solution. It is envisioned that this work will provide some information towards the effective implementation of water storage options in BC, particularly with reference to the Water Act which is currently undergoing modernization.

BLOOMING PROBLEMS: THE ROLE OF POLICY AND ENFORCEMENT IN THE ALGAE CRISIS AT PIGEON LAKE

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Water quality in many Albertan lakes has decreased due to the effect of over fertilization and improper sewage disposal methods. At Pigeon Lake in central Alberta, nitrogen and phosphate levels have been steadily increasing with a parallel increase of algal blooms. Poor water quality and algal blooms have affected many aspects of the lake's cultural and ecological health. Pigeon Lake serves as a source of recreation for tourists and local families as well as a bio-diverse habitat for species. A crisis of collective action has arisen among the communities that surround Pigeon Lake as various stakeholders offer criticism and blame for the algal blooms. The Albertan government, according to the Municipal Government Act, has allocated majority of the responsibility for the

Pigeon Lake Watershed to the municipalities that surround the body of water. The municipalities of Pigeon Lake have responded to the need for policy that combats poor water quality through attempts to educate the public and by drafting bylaws that prevent harmful activities. Small budgets, an inability to properly enforce by laws and the tragedy of the commons have inhibited the efficacy of policies. This poster analyzes the roles policy and enforcement play in improving Pigeon Lake's water quality.

THE DEATH AND LIFE OF THE LITTLE MOUNTAIN HOUSING PROJECT: BC'S FIRST PUBLIC HOUSING COMMUNITY

Tommy Thomson
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Opened in 1954, Vancouver's Little Mountain Housing Project was the first public housing project in BC. As such, Little Mountain was historically significant to the development of the welfare state in BC. Today, Little Mountain continues to be on the leading edge of provincial housing policy as it is the first public housing project to be privatized and redeveloped under a new policy announced in 2007. The proceeds of privatization are being re-invested in supportive housing. Thus, redevelopment represents a re-targeting of social housing away from low-income families toward the addicted and mentally ill. Redevelopment has involved the displacement of 194 Little Mountain households and the demolition of all but one of the buildings. This is disturbingly similar to the old urban renewal programs of the mid-twentieth century. But unlike urban renewal, the redevelopment of Little Mountain is connected to neoliberal restructuring and the erosion of the welfare state. When rebuilt, Little Mountain will feature a mixed-income community that will combine social housing tenants and market homeowners. Redevelopment has been justified, in part, on the basis that social mixing will create more social capital for social housing tenants. But Little Mountain was already remarkably rich in social capital. In contrast to the stereotype of the 'troubled housing project', Little Mountain offered a supportive, happy, and beautiful living environment. Little Mountain's culture of poverty was highly functional. Ironically, displacement has socially isolated many of the tenants and led to negative emotional/health and financial/material impacts.

THE ESTABLISHMENT OF SOVIET/POST-SOVIET NATIONAL PARKS: A SOCIO-POLITICAL PERSPECTIVE

Tripp, Michael W.
Vancouver Island University

The emergence and development of a network of national parks initiated in the waning moments of the Soviet Union and continuing into the post-Soviet era can be viewed as a product primarily of regional socio-political forces asserting increasing degrees of autonomy. Emboldened by the weakening of centralized administrative structures, the national park designation repeatedly was used by newly empowered constituencies, stakeholder groups and individuals to support claims to territorial jurisdiction cloaked in the perspective of environmental protection. Site selections thus were driven by attachments to the specifics of place and attendant proclamations of self-identity rather than to normative ecological or recreational national park criteria. As a consequence, the ensuing landscapes embrace complex matrices of historical, cultural and natural features reflective of regional and local identities. Appearing first in the outlying republics, the national park formation process diffused from the peripheries inwards to the Russian heartland and eastward into Siberia. With more recent trends towards recentralization of governmental authority the establishment rate of Russian national parks has been diminished though not halted as regions, especially those without such a site, continue to promote their inclusion.

INVENTING THE 'SALISH SEA': TOPONYMIC RESCALING, PERFORMATIVITY, AND THE MAKING OF TRANSNATIONAL SPACES

Brian Tucker, Dr. Reuben Rose-Redwood
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Over the past two decades, a growing number of scholars have begun to explore the cultural politics of toponymic inscription. The current study contributes to the emerging literature on critical place-name studies by examining the cultural and political implications of the recent designation of the water body along the shared Pacific coastline of Washington State and the Province of British Columbia as the 'Salish Sea.' Drawing upon theories of performativity, this presentation of preliminary results from a series of more than 40 interviews conducted over the past summer (2010) will consider the ways in which the naming of places is implicated in the rescaling of public conceptions of 'place' through the performative enactment of spatial identities. In order to capture a wide range of perspectives, the research team selected participants from a variety of different groups, including professional toponymists, cartographers, scholars, politicians, indigenous tribal representatives, marine biologists, and members of the media. The presentation will illustrate the importance of narrative and storytelling as an integral part of the cultural production of place. Although this new toponym was initially promoted to raise ecological awareness, it also has considerable implications for reshaping the political, economic, and cultural geographies of the region.

CARBON AND NITROGEN FLUX IN INTERTIDAL WETLANDS AT THE HEAD OF RIVERS INLET, BRITISH COLUMBIA, CANADA

Lee van Ardenne and Jonathan Hughes
University of the Fraser Valley

Here we evaluate the vertical distribution of carbon and nitrogen in intertidal sediments of wetlands located on alluvial fans made by the Kilbella and Wannock Rivers. Carbon-nitrogen ratios (C:N) are a proxy for past wetland productivity, and fluctuations in the C:N can be indicative of change in vegetation and sedimentation in a system. Soil and sediment data were collected at both sites by extracting blocks (20 x 20 x 40 cm) of peaty sediment from pits or exposed river banks. In the laboratory, sediment blocks were divided into 1-cm-thick horizontal slices and analyzed for carbon, nitrogen, and bulk density. Sedimentation rates were determined using Cs-137, Pb-210, and C-14 dating. C:N ratios within the Kilbella River wetland sediments ranged from 8.6 to 549 compared to those of the Wannock River site, which ranged from 8.4 to 17. Wetland sediments of the Kilbella River site reveal large fluctuations in the C:N with depth that, along with the presence of distinct sand layers, identifies a series of disturbance incidents that are lacking at the Wannock River site, where the C:N only slightly increases with depth. Average sediment accumulation rates were found to be 2.6 mm/yr and 0.58 mm/yr at the Kilbella and Wannock River sites, respectively. Results of this study suggest that rapid sedimentation events can alter the distribution of carbon and nitrogen. If this flux represents changes in wetland productivity due to disturbance, it likely also represents changes in ecosystem function provided by the wetland.

PIPELINE POLITICS AND ENVIRONMENTAL GOVERNANCE: (DIS)CONNECTING ALBERTA'S TAR SANDS AND B.C.'S NORTH COAST

Ryan Vandecasteyen and Philippe Le Billon
University of British Columbia

In May 2010, Enbridge Inc. made an official application to the Government of Canada for the creation of twinned condensate and crude oil pipelines that would connect Alberta's Tar Sands to Kitimat, and for the first time introduce crude oil tankers to B.C.'s North Coast. In September of 2010, one of the authors, as part of a team of three kayakers, embarked on a 900 km journey along the length of B.C.'s coast – from Kitimat to Vancouver – to explore the emotional, social and physical geographies of this controversial project. Despite Enbridge's claims of state-of-the-art safety measures, the pipeline would put at risk one of the few remaining 'truly wild' places on Earth. Supertankers would ship crude oil through habitat important to humpback and orca whales, salmon, sea lions, coastal wolves, the Spirit Bear, and the communities to which these natural elements are essential for survival. Decision over Enbridge's controversial project is for now focused on an Environmental Impact Assessment placed under the authority of Joint Review Panel established by the National Energy Board and the Minister of Environment. Examining the politics of Enbridge's Northern Gateway pipeline proposal, this project argues that many individuals and communities are abandoning the restrictive process of environmental impact assessment to redefine broader and distinct decision-making processes at upwards, downwards and outwards levels of influence and governance.

Seasonal Storage and Retention of Marine-Derived Nutrients in the Hyporheic Zone of the Horsefly River, British Columbia

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Every year, millions of sockeye salmon venture hundreds of kilometres from the Pacific Ocean to their natal spawning grounds. The nutrient-poor freshwater systems in which they spawn receive an influx of marine-derived nutrients upon the arrival of the salmon. These additional nutrients provide an important source of energy to enhance fish and aquatic productivity, as well as riparian wildlife and plant species. This study will investigate the hyporheic zone as an effective location of nutrient exchange between the streambed and riparian vegetation. The hyporheic zone is an area of mixing between groundwater and surface water where rapid and frequent hydrologic exchange occurs allowing for the renewal of nutrients and oxygen.

In this study, the retention time and winter storage of salmon-derived nutrients will be compared between two separate reaches (one artificial and one natural) of the Horsefly River, BC. Water and macroinvertebrates will be sampled from an identified hyporheic flow path and analyzed to determine concentrations of marine-derived nitrogen and phosphorus. Four sampling events (pre-salmon spawn, during peak spawn, post-spawn, and prior to spring break-up) will document nutrient storage during the 2011 sockeye salmon run.

The Fraser River basin, which includes the Horsefly River, is the second most productive sockeye salmon fishery in the world. Gaining a more comprehensive understanding of this critical hyporheic nutrient exchange system will facilitate better restoration and stream management decisions. An intact hyporheic zone will help ensure the health of the ecosystem for future salmon stocks.

UNIVERSITY OF THE FRASER VALLEY U-PASS PROGRAM: SUCCESS OR FAILURE?

Vanleeuwen, Kees A.
University of the Fraser Valley

The University of the Fraser Valley U-Pass program was implemented in 2009 when it was voted into existence with a high level of student support. With the stated goals of environmental improvement, money savings, and reduced traffic, the U-Pass went into full effect providing unlimited transit, business discounts, recreation center access and "My Safe Ride Home" enrolment in the municipalities of Abbotsford, Chilliwack and Mission. Now, a year after the program's start, the students were asked how they feel about the U-Pass and how it has affected their lives. Eight hundred and thirty nine survey responses have been used as the basis for a statistical analysis of the program's implementation. With the analysis of comparable university U-Pass programs as a baseline, viewed alongside the student survey responses, this report will assess UFV's experience, in terms of both student satisfaction and environmental stewardship. Hard numbers show that there has been a definite increase in transit use which is similar to that of other programs in similar spatial and demographic regions.

WHEN TO STOP…WHAT TO SEE AND DO: REFLECTIONS ON GEOGRAPHY OF JAPAN FIELD TRIPS IN 2008 AND 2010

Tom Waldichuk
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A traditional approach to a field trip is when the instructor leads students from place to place, and students take notes as information is delivered to them. An alternative approach is to travel to fewer places and give students more freedom to explore while assigning them research tasks. Field journal writing and drawing are effective methods for students to process and articulate what they have learned while performing these tasks. This presentation describes the experiences and evolution of a third year geography field course in terms of student-centred learning and field journal activities. In 2008 the field course involved extensive -- and expensive -- travel across Japan by charter bus and train. Most of the learning took place while instructors lectured at each place or while travelling between places. In 2010 the course involved less travel, and students were assigned a project in which they had to evaluate walking routes and describe the surrounding landscape. To be effective, however, this independent form of learning requires clear instructions beforehand on how to take field notes and prepare a field journal, and it requires mentoring while students are researching onsite. Students seemed satisfied travelling less and undertaking more independent learning activities.

DRIFTWOOD DOMINOES: LANDSCAPE HEGEMONY FROM SCOTLAND TO THE CANADIAN PLAINS

Michael C. Wilson
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British settlers viewed western Canadian First Nations as historically inconsequential and transient through an "empty" landscape. The imported wilderness concept (wild-tier-ness, "wild-beast-place") actualized a European abstraction. Aboriginal presence was edited out as settlers "improved" the land. Ironically, some were displaced Scots whose homes had been burned in another experiment at "improvement," the Highland Clearances. The Kildonan Gunns, in imposing a new Kildonan in the Red River valley, exemplified this game of "driftwood dominoes." They consciously usurped the very tract used by Assiniboin for annual ceremonies and there built a church, proclaiming victory over heathen rites. The lessons of displacement and placelessness were not learned; these maladies were merely passed along to the next recipients. The "empty land" justification endures in western Canadian local histories, feeding the pioneer image. In parks, the wilderness idealization continues to justify restoration of "natural areas" to "pristine conditions" without people: conditions unknown in the Holocene. The "wandering Indian" image still influences historians, archaeologists, and policy-makers. Yet for Plains peoples the landscape was a residence of memory and collective history. It is a hegemonic illusion that First Nations were less strongly tied to the land than were settled people. Euro-Canadian emphasis upon defended boundaries clouds understanding of aboriginal lifeworlds. Plains territories were idealized as centers with radiating vectors and indistinct boundaries that moved as the centers moved. Landscapes were known in minute detail, with forms and features understood as mnemonic devices. Whereas incoming settlers sought to own the land, indigenous peoples were "owned" by the land.

RESILIENCE AND THE DIVERSITY OF LAND-USES: HOW DIVERSE LAND-USES CAN HELP BUILD A RESILIENT CITY THAT IS ECONOMICALLY COMPETITIVE

Duncan Wlodarczak
Simon Fraser University

Over the last fifty years North American cities have developed with a separation of land-uses designed to isolate areas of employment, residence, and commercial uses. This separation has added to cities' contribution and vulnerability to many future crises, such as climate change mitigation and adaptation, and peak oil and resource depletion. This paper argues that to avoid this, cities' need to develop with a greater integration and diversity of land-uses. It explores the needed connections between economic development and sustainable land-use planning, arguing that by coordinating these efforts, cities can become more resilient to crises while maintaining their economic competitiveness.
To do this, the paper examines what aspects are needed to create areas that are both attractive to high-tech firms and match the principles of Smart Growth, a popular method of sustainable urban development. Using the example of high-tech firms, it analyzes two case study areas in Metro Vancouver: Yaletown, a dense neighbourhood in downtown Vancouver and Crestwood Corporate Centre, a traditional office park in Richmond. Through these case studies, I determine the important factors needed to attract high-tech firms while also finding connections with the aspects of Smart Growth needed to create more resilient clusters. I argue that economic development and sustainable urban development can have mutually beneficial results when coordinated with one another and that each model of development of areas for high-tech firms can be adapted to become more resilient.

ON NATURAL & CULTURAL DIVERSITY OF SHANGRI-LA REGION AND A DEVELOPMENT MODEL

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Harmony between human and nature has been a common dream. British author, James Hilton, wrote a novel in 1933 named Lost Horizon. In this book, he created a term of Shangri-la to name a beautiful, harmonious, and fascinating paradise east of the Tibetan Himalayas. For that reason, Shangri-la became a spirit of the Kingdom and an ideal destination.
In this paper, the bounder areas of Sichuan, Yunnan and Tibet, China are defined as the Shangri-la Region. The author discusses the natural and cultural diversity in the Shangri-la Region. The natural diversity consists of devious types and forms in geology, topography, climate, soil, vegetation, species and natural landscape. There are high mountains, deep gorges, at least nine bottom-up vertical natural zones, 50 percent of birds and mammals, as well more than 30 percent of higher plants of China. The natural environment is formed by effects of the geological structure, topography and climate. On the other hand, the cultural diversity includes ethnic, social, religious and economic diversity, etc. More than 20 ethnic minorities live here for generations. The human environment is formed by effect of the ethnic, cultural and physical geography.
On basis of some issues and challenges in social and economic development of the Shangri-la Region, for example, poverty, lagging development, ecological fragility, etc., the author argues that the Shangri-la Region should choose a development model, that is to say, protecting the natural and cultural diversity, then improving the agriculture, developing tourism and small hydroelectric station.

THE PACIFIC ARROWSMITH TRAIL ON VANCOUVER ISLAND

Charles York and Shawna Wagner
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The Pacific Arrowsmith Trail (PAT) is an undertaking that will create and manage a physical connection in the form of a hiking/walking trail between the communities of the Arrowsmith region on Vancouver Island. The PAT is currently in the planning phase, and was first developed as a concept to support the intentions of the Pacific Arrowsmith Institute (PAI). The aim of the PAI is to embrace the evolution of the region by strengthening the connections between communities sharing social-ecological systems, and by supporting local economic sustainability. Knowledge creation and sharing is becoming increasingly important to community and regional health and PAI intends to support this change by promoting the sense of identity, honouring First Nations traditional knowledge and current outlook, as well as promoting sustainable progress through inclusion and stimulation of local communities. The Oxford dictionary defines a pilgrimage as 'a journey to a place associated with someone or something well known or respected', which describes the premise of the PAT project. Visiting Vancouver Island is a breath-taking experience, so this pilgrimage concept, in conjunction with others like deep ecology, green logic, sacred ecology, and topophilia, is the driving force behind the trail creation process. Currently the trail development team is focused on establishing a management plan, forming relationships with local representatives from Pacific Arrowsmith Region communities and First Nations groups, and generating support and finances to facilitate the next phase of the PAT development.

QUATERNARY STRATIGRAPHY OF THE CENTRAL OKANAGAN VALLEY, BRITISH COLUMBIA [THOMSON]

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Theories on the origin of the valley-fill architecture and age of the Okanagan basin sediments remain divided between those favouring a pre-Fraser Glaciation age and those favouring a post-Fraser Glaciation genesis. Glacial sediments and landforms on the University of British Columbia campus near Kelowna BC were studied using surficial mapping, shallow seismic, and lithologic logs. Analysis revealed basin architecture consisting of fluvial valley fills, tributary fans, and subglacial flood deposits. The lowest valley sequence includes coarse fluvial sediments >65,000 yrs BP. Above are fine grained sand and layers of organics (woody debris) radiocarbon dated at 35,000 - 23,000 yrs BP. Dates indicate continual deposition leading up to and during glaciation.
The following sequence is proposed:
1) The Okanagan Valley operated as a pre-glacial river valley 65,000 - 23,000 yrs BP and filled with clastic sediments and woody debris during glacial onset.
2) During the Fraser Glaciation, several high energy subglacial floods from the north and northwest filled a subglacial lake that repeatedly drained.
3) Absence of tills in the central part of the valley and truncation of and esker distally indicates a late-stage water flow scoured out glacial sediments, except in the lee of bedrock obstacles.

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