15:05 Connecting historical collections: Place, space and GIS

Over the past ten years, many historical library collections have been digitized (textual, numerical, photos, maps) and made available online. However, they often exist on standalone platforms isolated from other digital collections. This presentation highlights how thinking spatially about collections and combining the power of GIS, geovisualization and metadata opens up new ways of linking collections to each other, based on their spatial attributes and combining them to produce new and interrelated narratives.

***Mr. Laliberté** is a librarian with over ten years' experience working with GIS and spatial data. Currently he is the GIS Librarian at the University of Alberta where much of his work revolves around analyzing and synthesizing spatial information at many scales, across many disciplines, in various formats and under numerous licensing agreements. Over the last decade, he has been involved with teaching different class sizes in a variety of learning environments. Recently, he has taken a great interest in connecting digitized historical collections based on their spatial attributes and in developing best practices for the long term preservation of digital geospatial data.*

15:30 The role of health in the use of human resources by urban coyotes

Parasitic infections are known to alter host behaviour, reduce body condition, and compromise the competitive and foraging abilities of their hosts. Moreover, reciprocal interactions between health, habitat use, and diet may promote reliance on anthropogenic resources. We tested the hypothesis that urban coyotes parasitized with sarcoptic mange make more use of anthropogenic food and habitat than unparasitized coyotes. To achieve this we GPS-collared 23 urban coyotes (11 with mange, 12 without) and quantified home range activity using cluster analysis. We also collected hair samples at capture for carbon and nitrogen stable isotope analysis and constructed three-source mixing models by grouping 115 prey items into three major prey types: berry; natural prey; and anthropogenic. Coyotes with mange assimilated significantly less nitrogen than healthy coyotes and consumed more anthropogenic food (60%) and less natural prey (5%) than healthy coyotes (20% and 60%, respectively). Coyotes with mange also used more developed habitat, exhibited more clustered use of their home ranges, and had more isolated clusters of activity than healthy coyotes. Our results suggest that coyotes are using different foraging strategies depending on body condition; coyotes in poor condition appear to routinely visit isolated patches of anthropogenic food rather than hunt throughout their home range. Further, there may be important reciprocal effects on body condition and use of anthropogenic foods, which could lead to increased reliance on anthropogenic resources and promote human-wildlife conflict in many species.

*After completing her undergraduate degree at Dalhousie University, **Ms. Murray** started studying urban coyotes with Dr. Colleen Cassady St. Clair in 2009. Since then she has studied the movement, habitat selection, and diet of over 25 GPS-collared coyotes living in Edmonton to help managers prevent human-coyote conflict using non-lethal methods.*

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UofA GIS Day

Tuesday, November 13, 2012

GISday

A Showcase of GIS Applications at the University of Alberta

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AGENDA

10:00	Coffee break on the CCIS mezzanine	
10:30	Welcome	*Presentations in* CCIS 1-160
10:45	Trends in GIS with particular emphasis in mobile, online and location analytics	**David Parry** *Esri Canada*
11:35	Simulating oil and gas footprint effects of proposed developments on caribou movement	**Eric Neilson** *ABMI*
12:00	Lunch on the CCIS mezzanine	
13:00	Influence of anthropogenic sound on burrowing owl crepuscular space-use	**Corey Scobie** *Biological Sciences*
13:25	Using digital terrain analysis and LiDAR data in archaeological survey design	**Robin Woywitka** *Earth and Atmospheric Sciences*
13:50	Dr. Strangelove or: How I learned to stop worrying and love GIS	**Derek Rennie** *AFNS*
14:15	GIS as a tool for planning	**Sinisa Vukicevic** *Earth and Atmospheric Sciences*
14:40	Projecting effects of climate change on boreal bird distribution and abundance	**Diana Stralberg** *Biological Sciences*
15:05	Connecting historical collections: Place, space and GIS	**Larry Laliberté** *Libraries*
15:30	The role of health in the use of human resources by urban coyotes	**Maureen Murray** *Biological Sciences*
15:55	Closing	

www.ualberta.ca/~gis

10:45 Trends in GIS with particular emphasis in mobile, online and location analytics

Mr. Parry *is an alumnus of the University of Alberta graduating in 1989, BSc. with Specialization in Geology, furthering his Studies at NAIT in GIS. Mr. Parry has been working in Mineral Geology and IT Professional Services for 23 years with clients across Canada. His focus in the past 15 years has been in applying Geographical Sciences especially Remote Sensing, GPS, and Information Technology to many facets of Natural Resources, Energy, Transportation, Public Safety, and Commercial & Government Policy Analysis and Decision Support.*

11:30 Simulating oil and gas footprint effects of proposed developments on caribou movement

Disturbances associated with oil and gas developments such as pipelines, roads, and wellpads may impede the movement of threatened woodland caribou in Alberta's boreal forest. However, in-situ projects in boreal Alberta are now only in early stages of development, with many projects yet to be initiated, making it difficult to assess whether and how much fully developed in-situ projects will impede caribou movement. We therefore modeled the impact of proposed in-situ oil and gas developments in northeast Alberta on caribou movement using in-situ footprint data simulated with R and ArcGIS. Wellpad distributions were simulated in proposed development leases with a spatial logistic regression model describing proposed footprint data provided by oil and gas companies. Simulated wellpads were clustered in R and clusters were transected using a directional distribution in ArcGIS to create trunk roads. Wellpads and trunk roads were connected using cost distance/cost path analysis. A step selection function model was created from existing GPS-caribou telemetry data to simulate caribou movement on the future landscape. We simulated caribou movement in response to future simulated in-situ development under different footprint permeability (impermeable to fully permeable), protected area (large protected area or not) and density (no spacing, 800 m and 2km minimum spacing) scenarios. We found that footprint permeability and large protected areas may play a key role in maintaining caribou movement in the oil sands region. Combining functions and tools from R and ArcGIS allowed us to simulate a large footprint dataset for flexibly testing future oil and gas development scenarios on caribou movement. The method could easily be transferred to other regions, land uses and species.

Mr. Neilson *is a GIS technologist working for the Alberta Biodiversity Monitoring Institute. He has expertise in mammal distribution modeling and predator prey interactions. He has conducted wildlife ecology and conservation research in Cambodia and Alberta. He completed a Bachelor of Arts from the University of Alberta and an MSc in Primate Conservation from Oxford Brookes University. Co-authours include Haitao* ***Li****, Dr. Tyler* ***Muhly****, Rob* ***Serrouya****, and Charlene* ***Nielsen****.*

13:00 Influence of anthropogenic sound on burrowing owl crepuscular space-use

A large portion of the Canadian grasslands have been developed for petroleum extraction, raising concerns about impacts to species at risk, such as the Burrowing Owl. Petroleum development changes landscape patterns with the construction of infrastructure and introduces sensory disturbances such as sound. Sound has the potential to have a large impact on wildlife in grasslands because there are fewer vegetative and topographic barriers to sound propagation and its influence can extend significantly beyond the source, potentially impacting a large area and wildlife contained therein. Birds such as the Burrowing Owl are especially susceptible to effects from sound as they rely heavily on auditory detection of prey and may travel far from the nest when hunting at night. Avoidance of areas with high sound pressure levels may increase overall home-range size and thus influence prey delivery and associated fledging rate. We tracked 67 adult male burrowing owls with miniature GPS data loggers, in Alberta and Saskatchewan. All home ranges included at least one sound source (compressor station, oil battery, oil well or road with more than 30 vehicles per hour), a variety of land cover types and varying amounts of petroleum development and maintenance. Sound was measured from sound-producing structures within owl home ranges and anthropogenic features (roads, gas and oil wells, buildings, etc.) and land cover types were classified and recorded around all nests. A resource selection function was used to evaluate owl selection of land cover and sound pressure levels at one third octave bands. We show whether adult male burrowing owls are influenced by sound while travelling at night.

Mr. Scobie *is a Ph.D. Candidate in the Department of Biological Sciences. He is studying the relationship between human development and burrowing owl space-use and reproductive success on the grasslands of Alberta and Saskatchewan. Corey has worked with grassland species at risk for the past 12 years, with a focus on impacts from petroleum development. Co-authours include Drs. Erin* ***Bayne****, and Troy* ***Wellicome****.*

13:25 Using digital terrain analysis and LiDAR data in archaeological survey design

Most archaeological sites in forested regions of Alberta occur on small landforms in association with water sources. Many of these landforms are difficult to identify in conventional DEMs and topographic maps. LiDAR DEMs can be used to resolve terrain features in finer detail, frequently at scales consistent with landforms of archaeological interest. Fieldwork conducted in the foothills of Alberta assessed the efficacy of LiDAR products in survey design. Results indicate that the use of these products improved survey efficiency and increased site detection rates. Additional pilot studies have shown that these data can be used in regional modeling and for anthropogenic feature detection.

Mr. Woywitka*'s interest in GIS was sparked during a geoarchaeological survey of the Snake Indian River valley in Jasper National Park 15 years ago. He has since completed an MA in Anthropology (University of Alberta) and an MGIS (University of Calgary) to round out his spatial and archaeological skill sets. Robin is currently employed by the Archaeological Survey of Alberta and is pursuing a PhD in Quaternary Geology at the University of Alberta.*

13:50 Dr. Strangelove or: How I learned to stop worrying and love GIS

GIS has become an essential aspect of our experiments, studies and surveys for plant diseases. Our conventional approaches to spatial data management were very worrying and we were not getting the most out of our hard work. This is a story of how GIS has changed our lab for the better.

Mr. Rennie *is a research technician in the laboratory of Dr. Stephen Strelkov. He is an alumnus of the University of Alberta where he studied plant biology and, later, did post-graduate work in plant pathology.*

14:15 GIS as a tool for planning

Application of GIS in different aspects of planning through three main approaches: as an inventory application, as a policy analysis application and as a decision-making application.

Dr. Vukicevic *is an Urban Planner and GIS Specialist. He joined Department of Earth and Atmospheric Sciences, University of Alberta in 2012 after he recently moved from Europe to Canada. He obtained nearly 12 years of international working experience in planning and GIS focusing on GIS-based spatial analysis within urban planning, land-use modelling and strategic environmental assessment. He currently teaches students application of GIS within social science, Urban Planning and Urban Design. Since coming to UofA, and to Canada, he was project coordinator on planning projects from regional to local area plan level in several European countries. He was also involved in European project COREPOINT. His professional work has been recognized with awards in urban planning, urban design and land management field. A fellow of the Serbian Spatial Planners Association, he was recently appointed as president of committee for international relationships. Also, he is a member of the Irish Planning Institute and in the process of securing CIP membership.*

14:40 Projecting effects of climate change on boreal bird distribution and abundance

Climate models project the rapid warming of boreal and arctic regions of North America, suggesting that boreal forest vegetation and fauna will track these changes and shift northward over the next century. We used a comprehensive dataset of bird surveys from across boreal Canada and Alaska, combined with best-available interpolated climate data, to develop bioclimatic niche models of distribution and density for 76 species of boreal forest songbirds. We then used a 4-km-pixel downscaling of projected climates in future periods to assess the potential for these species to shift their ranges in response to climate change. We mapped projected shifts in distribution and density, and identified potential climate refugia—areas of overlap between current and future periods. For several species of conservation concern our models projected that suitable climatic conditions for breeding will become more restricted and fragmented in the future, and that only a small portion of the current ranges of these species will exist in refugia by the end of the century. For several other species, projected increases in the connectivity of suitable climates may facilitate range expansions into Alaska and the southern Arctic by the end of the century. Although the spatial resolution of our models is appropriate for regional and boreal-wide conservation planning efforts, we are also using finer-scale climate and vegetation data to identify additional refugia within Alberta.

Ms. Stralberg *is a PhD student in the Biological Sciences Department (Bayne/Schmiegelow co-supervisors) working with the Boreal Avian Modelling Project (http://www.borealbirds.ca/). She holds an MS in Resource Ecology and Management from the University of Michigan, and a BS in Mathematics/Applied Science from UCLA. Her extensive GIS background began in 1996 with her MS research on habitat fragmentation effects on Southern California birds. She worked for 10 years as a GIS Specialist and Landscape Ecologist at PRBO Conservation Science (founded as the Point Reyes Bird Observatory) in California. Her current graduate studies at the UofA focus on modeling avian distributional responses to climate, vegetation, and land use patterns at scales ranging from individual sites to the Canadian boreal region.*