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.

15:10  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 make more use of anthropogenic food and habitat than healthy coyotes. Depending 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 Cassidy 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.

AGENDA

10:00  Coffee break on the CCIS mezzanine

10:30  Welcome

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

11:35  Simulating oil and gas footprint effects of proposed developments on caribou movement

12:00  Lunch on the CCIS mezzanine

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

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

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

14:15  GIS as a tool for planning

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

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

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

15:55  Closing
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 in the 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 a Delaunay triangulation analysis. A step selection function using ArcGIS-carcibou telemetry data to simulate caribou movement in the future landscape. We simulated caribou movement in future projects using 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 use types, and caribou 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, Australia, Canada, and the Bahamas. His Ph.D. from the University of Alberta was in GIS. Mr. Neilson has a Master of Science in GIS from Oxford Brookes University. Co-authors include Hailao Li, Dr. Tyler Muhly, Rob Serrouya, and Charlene Nielsen.

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

A large portion of the Canadian grasslands have been developed for petroleum extraction, raising concerns about impacting regions such as the Burrowing Owl. We manipulated crepuscular 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 altering the behaviour and wildlife contained within. Bioacoustics 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 using GPS data loggers, in Alberta and Saskatchewan. All home ranges included at least one sound source (compressor station, oil field, 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 loggers placed in all home ranges and anthropogenic sound data (gas and oil wells, building types, airports, etc.) were added to the model and recorded around all nests. A resource selection function was used to evaluate 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. Scoble is a PhD Candidate in the Department of Biological Sciences. His research 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-authors 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. These sites 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 landform and archaeological scale limits. Fieldwork conducted in 2004-2011 tested the efficacy of LiDAR products in survey design. Results indicate that the use of these products improved survey accuracy and increased site detection rates. Additional pilot studies have shown that these data can be used in regional modeling and for anthropogenic feature detection.

Dr. M. McKeen 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. Rob is currently employed by the Archaeological Survey of Alberta and is pursuing his PhD in Quaternary Geomorphology.

13:50 Strangelove: 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.

Ms. Stralberg is a Research Technician in the lab of Dr. Stephen Shrestak. 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 EAU 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. He has worked for more than 15 years with both national and international clients across Canada. Mr. Parry has been working in Mineral 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. Mr. Rennie is a research technician in the lab of Dr. Stephen Shrestak. 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 species occurrence records from a large database of avian surveys across boreal Canada to test our 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 anticipated 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 suitable climatic conditions for breeding will shift with warming. For several other species, projected increases in the connectivity of suitable climates may facilitate range expansions into Alaska and the southern boreal region 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 data to project the potential for boreal forest birds to shift their ranges.

Ms. Strafford is a PhD student in the Department of Zoology, University of Guelph. Ms. Strafford began her MSc in Applied Ecology in 2001 with a special interest in utilizing GIS and remote sensing to study avian populations. Her research focuses on the habitat fragmentation and functional connectivity of northern Minnesota’s boreal forest. Her project will begin in 2004 with her MS research on habitat fragmentation effects on boreal forest birds. She worked for 10 years as a GIS Specialist and Landscape Ecologist at PPRB Conservation Science (founded as the Point Reyes Bird Observatory) in California. Her current graduate studies at the University of Guelph focus on modeling avian distributional responses to climate, vegetation, and land use patterns at scales ranging from individual sites to the Canadian boreal region.