UNIVERSITY OF SASKATCHEWAN

Department of

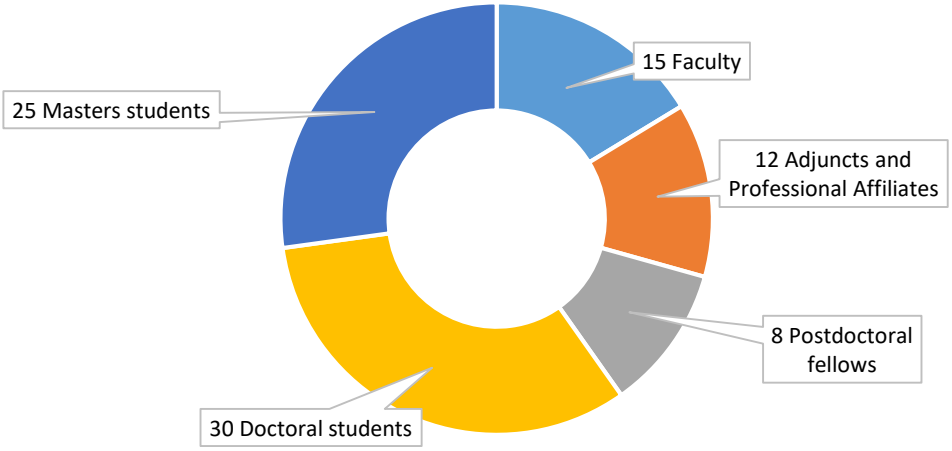
GEOGRAPHY & PLANNING

RESEARCH PROFILE

- & -

2015-16 ACTIVITY REPORT

The Department



Research by the Numbers, 2015-16

40+
Academic journal papers

7
Book chapters

1
Books and edited volumes

60+
Invited lectures and presentations

40+
Presentations at conferences and workshops

10+
Technical reports and conference proceedings

1.8 *million dollars in new funding secured as principal or co-investigator*

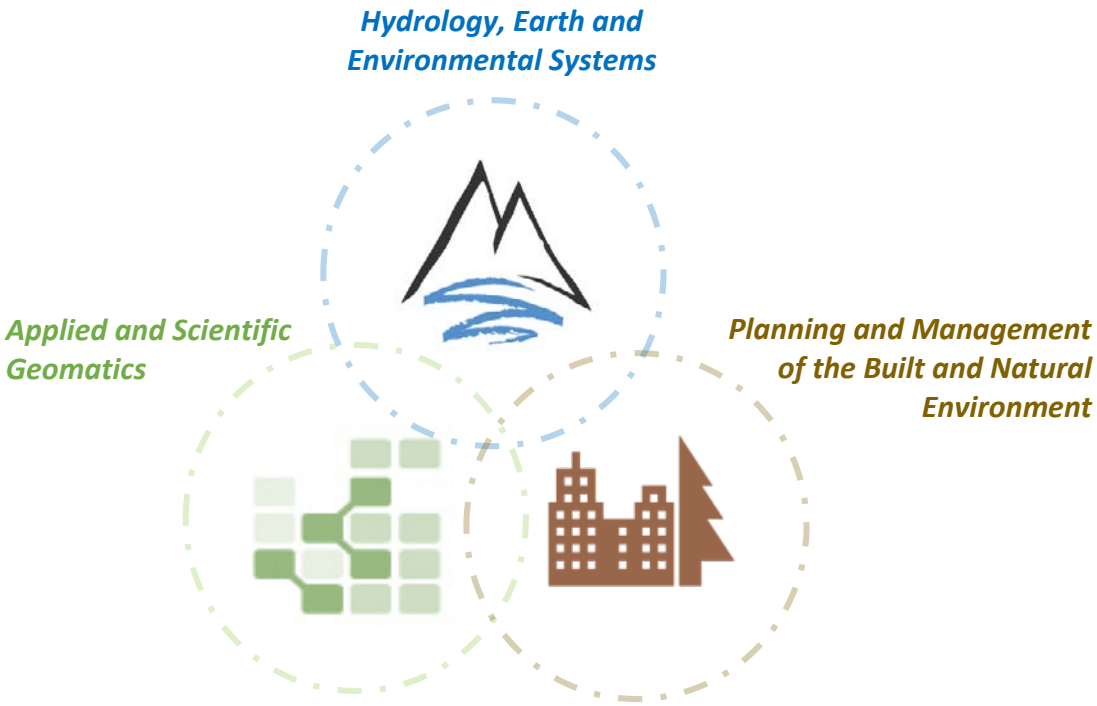
Research Mission and Values

The Department of Geography and Planning shares the University's mission to achieve excellence in the scholarly activities of teaching, discovering, preserving, and applying knowledge. Included amongst the values we hold as important in guiding our research are: excellence in scholarship and graduate student mentoring; academic freedom and independence; interdisciplinarity, integration and collaboration.

We are committed to research with impact both within and beyond the scholarly community – research that tackles today's societal and environmental challenges, stimulates public debate on pressing environmental and community issues, and addresses challenges framed by our sense of place stretching from the local to international scales.

Research Focus

Research activity in our department exemplifies the spirit of the disciplines of geography and planning and is concentrated in three overlapping domains: *Hydrology, earth and environmental systems; Applied and scientific geomatics; Planning and management of the built and natural environment.* Much of our research occurs at the boundaries of these domains, is cross-cutting, and is focused on integrative approaches to addressing scholarly and societal challenges and mobilizing knowledge.



Hydrology, Earth and Environmental Systems

Modeling and understanding hydrological, ecological and geophysical systems and interactions with the human environment.

Our research is focused on understanding, assessing, and modeling physical environmental systems and processes and the landscapes they create, including how environmental systems are changing under natural and human-induced stress. This includes research on water supply resilience and vulnerability, marine environments, responses of river flow and glacier cover to climate change, fluvial geomorphology, erosion modeling, wetland science, and eco-hydrology.

Research also occurs at topical boundaries, using applied geomatics and other tools and exploring the implications of physical environmental change for policy, planning, and management of the human environment. This includes research focused on flood risk management, environmental impact assessment, and decision support tools for wetland assessment and watershed management.

Our Department is home to the Centre for Hydrology, a Tier I Canada Research Chair in Water Resources and Climate Change and the Associate Program Director of Global Water Futures. The Centre for Hydrology manages much of its research relating to mountain hydrology at the Coldwater Laboratory in Canmore, Alberta.

Some of our current research projects include:

- Rocky Mountain water supply resilience and vulnerability evaluation
- Expanded testing and development of the Prairie Hydrological Model in Prairie pothole watersheds
- Sensitivity of Dempster highway hydrological responses to climate warming
- Long-term ecology and seabed habitat mapping, Frobisher Bay, Nunavut
- Assessing community structure of marine benthos, Canadian Beaufort Sea shelf
- Understanding the alterations of hydrogeomorphic processes by beavers in southern South America
- Assessment of PAH distributions in sediments in the Alberta oil sands monitoring area and western Lake Athabasca
- Assessing beaver influence on mountain peatland form and ecohydrologic function
- Integrated systems modeling of land owner values and water quality in the Qu'Appelle watershed

Applied and Scientific Geomatics

Advancing GIS, spatial statistics and remote sensing, with applications to problems in the social, physical and environmental sciences.

Our research is focused on the development of remote sensing techniques for assessing forests and grasslands productivity, using GIS and spatial statistics in health research and urban geography, and developing tools to examine human mobility, navigation, and interaction in urban environments.

Research also occurs at topical boundaries, contributing the development and application of geomatics for understanding physical systems and supporting policy and planning decisions. This includes collaborative research with computer science, plant science, and other scholars, practitioners and decision makers from the social, health and natural sciences. Our work in this area includes the development of new tools and the integration of emerging technologies, such as the development of smartphone applications for indoor positioning and mobility tracking, the use of field based sensor systems, and the integration of drones for environmental modeling.

Our research is supported in part by The Spatial Initiative, and our Department is home to its current Academic and Scientific Director.

Some of our current research projects include:

- Integrating measures of grassland function using Remote Sensing
- Development of monitoring methods for dead materials in Alpine pastures using Remote Sensing data in Qinghai-Tibet plateau
- SEA application for landscape-based, temporal analysis of wetland change in urban environments
- Remote sensing of terrestrial non-photosynthetic vegetation using hyperspectral, multispectral, SAR, and LiDAR data
- Detecting spatial and temporal changes in land cover on Aboriginal reserves
- Developing indoor positioning tools for use with smartphone based tracking applications to study human movement and interaction
- Methods development for understanding human behavior during navigation
- Spatial analysis of and access to health care services in urban areas

Planning and Management of the Built and Natural Environment

Planning and design of urban and rural spaces, and assessing and managing human interactions with the natural environment.

Our research is focused on the built and natural environment, including human well-being and the planning and design of urban and rural spaces. This includes research on the origins of city form, urban quality, sustainable cities, municipal governance, Indigenous health, Indigenous urbanism, age-friendly communities and human behavior and navigation.

Research also occurs at topical boundaries, including natural resources planning and management and exploring human interactions with the natural environment using applied geomatics and other analytical tools. This includes research focused on watershed planning and management, flood risk management, environmental policy and planning, sustaining northern communities, energy policy, and environmental and social impact assessment.

Our research is supported by collaborations with a variety of external government, industry and community partnerships and on-campus partnerships. Our Department is also home to the Prairie Research Centre of the Urban Aboriginal Knowledge Network, and its Director.

Some of our current research projects include:

- Cumulative impact monitoring for decision support in the Mackenzie Valley, NWT
- Baseline analysis for marine shipping impact assessment in Nunavut
- Source water protection planning with First Nations in Saskatchewan
- Assessing the role of environmental researchers in the transmission of land based skills and knowledge to Inuit youth in Canada
- Indigenous health policy network analysis of northern Saskatchewan: linking climate change, youth suicide, decision making and policy gaps
- The emergence of Type 2 diabetes in First Nations and Métis communities
- Indigenizing city planning processes in Canada's large Prairie cities
- Examining the role(s) of citizens, artists, community-organizations, businesses and decision makers in approaches to urban change that honour diversity
- Analysis of perceptions of credible science among policy stakeholders about nuclear energy
- Analysis of flood risk mitigation options for rural communities

Research Funding Environment

Our research funding provides opportunities for graduate student training at both the Master's (MA, MSc) and PhD level. Our faculty and graduate students have been successful in obtaining Tri-Agency funding from NSERC, SSHRC, and CIHR, with some faculty having received funding from more than one Tri-Agency. Our research is also funded by a variety of other sources, including CFI, SSHRF, Mitacs, ArcticNet, ISTP Canada; federal, provincial, territorial and municipal government departments and agencies (e.g. Environment Canada, Water Security Agency, Parks Canada, Canadian Environmental Assessment Agency, Government of the Northwest Territories, Nunavut Research Institute, Northern Scientific Training Program, City of Saskatoon); foundations (e.g. Weston Foundation); and centres (e.g. Sylvia Fedoruk Canadian Centre for Nuclear Innovation). Our funding sources reflect the breadth and interdisciplinary nature of research in the Department of Geography and Planning.

Funding Announcements, 2015-16

Integrating measures of grassland function using Remote Sensing
NSERC Discovery Grant ($35,000/yr x 5)
Xulin Guo (PI)

What is known about the impacts of alternative energy development?
SSHRC Knowledge Synthesis ($23,900)
B. Noble (Co-I)

Impacts of large-scale forest cover changes on snow hydrology and stream flow generation in mountain headwater watershed
Alberta Environment and Sustainable Resource Development ($50,000)
J. Pomeroy (PI)

Sensitivity of Dempster highway hydrological response to climate warming
Yukon Government ($77,640)
J. Pomeroy (PI)

Assessing information needs to make decisions regarding cumulative effects under the MVRMA
Government of the Northwest Territories, CIMP ($148,452)
B. Noble (PI)

Monitoring method for dead materials of Alpine pasture by satellite remote sensing, Qinghai-Tibet Plateau
Qinghai Science & Technology ($58,000)
X. Guo (Co-I)

Rocky Mountain water supply resilience and vulnerability evaluation
Alberta Innovates ($550,000)
J. Pomeroy (PI)
C. Westbrook (Co-I)

Recommendations for Saskatchewan hydrological modelling
Water Security Agency ($50,000)
J. Pomeroy (PI)

Water quality modelling system of the Qu'Appelle River catchment for long-term water policy development
Environment Canada
($309,000)
B. Noble (Co-I, $53,000)

Expanded testing and development of the Prairie hydrological model in three Prairie pothole watersheds
Ducks Unlimited Canada ($381,900)
J. Pomeroy (PI)

Age-friendly communities - Friendly for whom?
SSHRC Insight ($287,468)
R. Walker (Co-I)

Research Highlights, 2015-16

Dr. Alec Aitken

Frobisher Bay Long-term Ecology and Habitat Mapping Study. Frobisher Bay, NU, like many Arctic coastal marine systems, is undergoing rapid anthropogenic and climatic change. Limited scientific work has been conducted in the bay in the past 40 years, some of which has included seabed ecological surveys in select areas. By collecting sediments and underwater video we are resampling these areas to determine if their ecology has shifted with human development and changing climate, and also to establish baseline knowledge as development intensifies and the climate continues to warm. We will also be increasing the scope of research in Frobisher Bay to learn how seabed habitats are distributed throughout the bay on a broader scale. The product of this broader scale habitat mapping will be maps showing the distribution of seabed habitats in their current state. This information will be vital to future decision makers as we collectively attempt to gauge the impact of climate change and development on seabed habitats in the Arctic.

Dr. Paul Hackett

Body Mass Index (BMI) Values for Students Entering Residential School, 1919 to 1953. First Nations people in Canada experience obesity and diabetes at rates that greatly exceed that of the general population. Little is known about when and how these co-epidemics emerged. Our pilot study calculated BMI values for 1,700 children entering five residential schools in Manitoba and Saskatchewan during the first half of the twentieth century. We found that children, overwhelmingly, had normal BMIs. This contradicts the justification of the federal government for nutritional experiments on students at the time, and provides evidence that the current epidemics have recent origins. Future research will unravel the impact of residential schools on First Nations health across Canada, by establishing a unique study cohort that spans the residential school era to the present, and will explore the contribution of cultural change and economic development. This research will also focuses on the intergenerational and epigenetic effects of the schools, with the goal of guiding effective and culturally-appropriate community-level interventions for the future.

Dr. John Pomeroy

Canadian Rockies Hydrological Observatory (CRHO). Uncertainty in future water flows is one of the great challenges facing western Canada. Both energy and food security are tied to water resources via hydroelectricity, oilsands development and processing, and irrigation agriculture. The CRHO aims to improve the understanding of and capacity to predict the changes in water yield from headwater basins where cold climate processes predominate. It examines the water supply response to climate variability in a range of mountain headwater ecohydrological site types, incorporating the transient responses of both climate forcing and cryospheric and basin hydrological response. Particular attention is paid to how snowpacks, glaciers, groundwater, wetlands, forests and frozen soils interact and modulate the response of water supply to variability in climate. An important focus is downscaling climate model products over complex mountain terrain. The project supports improved water resource modelling and management over larger river basins by contributing advanced mountain headwater hydrological modelling capability and future flows under downscaled climate scenarios.

FACULTY

ALEC AITKEN, PROFESSOR
Arctic marine biology; Quaternary geology and geomorphology; Paleo-Indian settlements on the Canadian Prairies

ABRAHAM AKKERMAN, PROFESSOR
Population and demography; Urban design; Origins of city form; Planning and development; Phenomenology of the built environment

SCOTT BELL, PROFESSOR
Geographic information science; Navigation and wayfinding; Cartography; Human spatial cognition; Health geography

JILL BLAKLEY, ASSOCIATE PROFESSOR
Regional planning; Natural resource management; Strategic environmental assessment; Cumulative effects assessment; Public space design and measurement; Urban quality

NICOLAS BRUNET, ASSISTANT PROFESSOR
Northern development and planning; Socio ecological systems; Scientific partnership development and communication; Arctic town planning and design; Adaptation to climate change

KRYSTOPHER CHUTKO, ASSISTANT PROFESSOR
Current and past variability in terrestrial and aquatic processes; Lake sediments and changes in lake productivity; Development of predictive models of lake productivity; Water sourcing and routing through the use of stable water isotopes

DIRK DE BOER, PROFESSOR, DEPARTMENT HEAD
Impact of human activity on sediment quality using lake sediment; Detecting changes in water and sediment quality using long-term monitoring data; Modeling erosion and sediment yield in large-scale drainage basins

Xulin Guo, Professor
Remote sensing; Integrating measures of grassland functioning using remote sensing; Remote sensing applications for landscape change, physical systems and in urban environments

Paul Hackett, Assistant Professor
History of Aboriginal health; Diffusion of directly transmitted, acute infectious diseases; Impact of cultural change on community health; History of tuberculosis among First Nations of western Canada

Lawrence Martz, Professor, Vice Dean, Faculty Relations
Digital terrain analysis for hydrological modeling applications; Cartography; Hydrology; Geomorphology; Digital elevation models

Bram Noble, Professor
Environmental impact assessment; Resource policy; Resource development; Water resources management Energy policy; Environmental decision making; Aboriginal engagement in resource development

Robert Patrick, Associate Professor
Land use and watershed planning; Source water protection; Water security; Integrated water resources management and Indigenous communities; Low impact development in urban areas

John Pomeroy, Professor, Tier 1 CRC
Physical hydrology; Cold regions processes; Watershed modeling; Hydrometeorology; Impact of land use and climate change on hydrology; Snow processes; Improved prediction of floods and droughts

Ryan Walker, Associate Professor
Urban planning and geography; Indigenous urbanism; Public space design and measurement; Age-friendly communities; Multi-level governance

Cherie Westbrook, Associate Professor
Wetland science; Response of wetland form and function to natural and human stressors; Groundwater-surface water interactions in alpine wetlands; Decision support tools for flood risk management; Influence of beaver on wetland form and function

Publications, 2015-16

Books

Akkerman A, 2016. *Phenomenology of the Winter-City*. Springer: Heidelberg, Dordrecht, London, New York, pp. 230 + xii

Book Chapters

Fidler C, **Noble BF**. 2016. Advancing regional strategic environmental assessment in Canada's western Arctic: Implementation opportunities and challenges. In Fischer T (Ed.) *Progress in Environmental Assessment Policy, and Management Theory and Practice*. London: Imperial College Press, p 211-239.

Gunn J, **Noble BF**. 2015. Sustainability considerations in regional environmental assessment. In A Morrison-Saunders, J Pope, A Bond (Eds.) *Sustainability Assessment Handbook*. Cheltenham, UK: Edward Elgar, pp. 79-102.

Noble BF, **Gunn J**. 2016. Strategic environmental assessment. In K Hanna (Ed.) *Environmental Assessment: Practice and Participation*. Toronto: Oxford University Press, pp 96-121

Noble BF. 2015. Scoping out potentially significant impacts: Constraints of current regulatory-based cumulative effects assessment. In M Gillingham, C Johnson, M Parkes, G Halseth (Eds.) *The Integration Imperative: Addressing the Cumulative Environmental, Community and Health Effects of Multiple Natural Resource Developments*. New York, NY: Springer, pp. 176-181

Parkins J, Bullock R, **Noble BF**, Reed M. 2015. Forests and communities on the fringe: An overview of community forestry in Alberta, Saskatchewan and Manitoba. In S Teitelbaum (Ed.) *Community Forestry in Canada: Lessons from Policy and Practice*. Vancouver: UBC Press, pp. 90-102.

Tong A, Lu B, He Y, **Guo X**. 2016. Role of remote sensing in sustainable grassland management: a review and case studies for a mixed grass prairie ecosystem. In Q Weng (Ed.) Remote Sensing for Sustainability.

Westbrook CJ, **Noble BF**. 2016. Environmental assessment in Saskatchewan. In K Hanna (Ed.) *Environmental Assessment: Practice and Participation*. Toronto: Oxford University Press, pp. 340-353

Journal Publications

Akkerman A. 2015. Myths of the North and origins of city-form: Some reflections across history and prehistory. *Journal of Architecture and Urbanism* 39(3): 165-175.

Berdahl L, Bourassa M, **Bell S**, Fried J. 2016. Exploring perceptions of credible science among policy stakeholder groups results of focus group discussions about nuclear energy. *Science Communication* 38(3): 382-406.

Bernhardt M, Schulz K, **Pomeroy JW**. 2015. The International Network for Alpine Research Catchment Hydrology: a new GEWEX crosscutting project. *Hydrologie and Wasserbewirtschaftung (Hydrology and Water Resources)* 59 (4): 190-191.

Bourassa M, Doraty K, Berdahl L, Fried J, **Bell S**. 2016. Support, opposition, emotion and contentious issue risk perception. *International Journal of Public Sector Management* 29(2): 201-216.

Buttle JM, Allen DM, Caissie D, Davison B, Hayashi M, Peters DL, **Pomeroy JW**, Simonovic S, St-Hilaire A, Whitfield PH. 2016. Flood processes in Canada: Regional and special aspects. *Canadian Water Resources Journal* 41(1-2): 7-30.

Chen L, Chen A, **Guo X**, Zhou C. 2016. Impact factor analysis of mixture spectra unmixing based on independent component analysis. *Journal of Applied Remote Sensing* 10(1): 015012

Chu C, **Guo X**, Takeda K. 2016. Temporal dependence of burn severity assessment in the Siberian Larch (Larix Sibirica) forest of northern Mongolia using remotely sensed data. *International Journal of Wildland Fire* (Article in press).

Chu T, **Guo X**, Takeda K. 2016. Remote sensing approach to detect post-fire vegetation regrowth in Siberian boreal larch forest. *Ecological Indicators* 62:32-46.

Dumanski S, **Pomeroy JW**, **Westbrook CJ**. 2015. Hydrological regime changes in a Canadian Prairie basin. *Hydrological Processes* DOI: 10.1002/hyp.10567.

Fang X, **Pomeroy J**. 2016. Impact of antecedent conditions on simulations of a flood in a mountain headwater basin. *Hydrological Processes*. DOI: 10.1002/hyp.10910.

Fawcett RB, **Walker R**, Greene J. 2015. Indigenizing city planning processes in Saskatoon, Canada. *Canadian Journal of Urban Research* 24(2): 158-175.

Hackett P, Abonyi S, Dyck R. 2016. Anthropometric indices of First Nations children and youth on first entry to Manitoba/Saskatchewan residential schools -- 1919 to 1953. *International Journal of Circumpolar Health* doi.org/10.3402/ijch.v75.30734.

Harder P, **Pomeroy JW**, **Westbrook CJ**. 2015. Hydrological resilience of a Canadian Rockies headwaters basin subject to changing climate, extreme weather, and forest management. *Hydrological Processes.* DOI: 10.1002/hyp.10596.

Jones M, Shah T, Hayes A, Uswak G, **Bell S**. 2016. Dental service disparities in Canada: A Saskatoon, Saskatchewan case study. *The Canadian Geographe*r doi:10.1111/cag.12286.

Lashta E, Berdahl L, **Walker R**. 2016 Interpersonal contact and attitudes towards Indigenous peoples in Canada's prairie cities. *Ethnic and Racial Studies* 39(7): 1242-1260.

Lees J, Jaeger J, **Gunn J**, **Noble BF**. 2016. Analysis of uncertainty consideration in environmental assessment: an empirical study of Canadian EA practice. *Journal of Environmental Planning and Management* DOI:10.1080/09640568.2015.1116980.

Leung W, **Noble BF**, Jaeger J, **Gunn J**. 2016. Disparate perceptions about uncertainty consideration and disclosure practices in environmental assessment and opportunities for improvement. *Environmental Impact Assessment Review* 57: 89-100.

Liu A, Mooney C, Szeto K, Thériault JM, Kochtubajda B, Stewart RE, Boodoo S, Goodson R, Li Y, **Pomeroy JW.** 2016. The June 2013 Alberta catastrophic flooding event: Part 1 – climatological aspects and hydrometeorological features. *Hydrological Processes* DOI: 10.1002/hyp.10906.

McGrane D, Berdahl L, **Bell S**. 2016. Moving beyond the urban/rural cleavage: measuring values and policy preferences across residential zones in Canada. *Journal of Urban Affairs* DOI 10.111/juaf.12294.

Musselman KN, **Pomeroy JW**, Essery RLH, Leroux N. 2015. Impact of windflow calculations on simulations of alpine snow accumulation, redistribution and ablation. *Hydrological Processes* 29(18): 3983-3999.

Noble BF, Nwanekezie K. 2016. Conceptualizing strategic environmental assessment. *Environmental Impact Assessment Review* DOI:10.1016/j.eiar.2016.03.005.

Olagunju A, **Gunn J**. 2016. Integration of environmental assessment with planning and policy-making on a regional scale: A literature review. *Environmental Impact Assessment Review* 61: 68-77.

Olagunju A, **Gunn J**. 2016 Challenges to integrating planning and policy-making with environmental assessment on a regional scale--a multi-institutional perspective. *Impact Assessment and Project Appraisal* 34(3): 1-18.

Patrick R, Bharadwaj L. 2016 Mining and campesino engagement: an opportunity for integrated water resources management in Ancash, Peru. *Water International* 41(3): 468-482.

Prusak SY, **Walker R**, Innes R. 2015. Toward Indigenous planning? First Nation community planning in Saskatchewan, Canada. *Journal of Planning Education and Research* 36(4): 440-450.

Petrucka P, Bickford D, Bassendowski S, Goodwill W, Wajunta C, Goodfeather L, **Hackett P**, Jeffrey B, Rauliuk M. 2016. Positive leadership, legacy, lifestyles, attitudes, and activities for Aboriginal youth: A wise practices approach for positive Aboriginal youth futures. *International Journal of Indigenous Health* 11(1): 177-197.

Pomeroy JW, Stewart RE, Whitfield PH. 2016. The 2013 flood event in the South Saskatchewan and Elk River basins: Causes, assessment and damages. *Canadian Water Resources Journal* 41(1-2):105-117.

Pomeroy JW, Xing F, Marks D. 2016. The cold rain-on-snow event of June 2013 in the Canadian Rockies – Characteristics and diagnosis. *Hydrological Processes* DOI:10.1002/hyp.10905.

Rasouli K, **Pomeroy JW**, Marks D. 2015. Snowpack sensitivity to perturbed climate in a cool mid-latitude mountain catchment. *Hydrological Processes* DOI: 10.1002/hyp.10587.

Rothwell R, Hillman G, **Pomeroy JW**. 2016. Marmot Creek experimental watershed study. *The Forestry Chronicle* 92(1):32-36. DOI: 10.5558/tfc2016-010.

Shook K, **Pomeroy JW**. 2016. The effects of the management of Lake Diefenbaker on downstream flooding. *Canadian Water Resources Journal* 41(1-2): 261-272.

Sizo A, **Noble BF**, **Bell S**. 2016. Strategic environmental assessment framework for landscape-based, temporal analysis of wetland change in urban environments. *Environmental Management* 57(3): 696-710.

Sizo A, **Noble BF**, **Bell S**. 2016. Connecting the strategic to the tactical in SEA design: an approach to wetland conservation policy development and implementation in an urban context. *Impact Assessment and Project Appraisal* 34(1): 44-54.

Stanley K, **Bell S**, Kreuger LK, Bhowmik P, Shojaati N, Elliott A, Osgood ND. 2016. Opportunistic natural experiments using digital telemetry: a transit disruption case study. *International Journal of Geographical Information Science*, 1-20.

Wang H, **Patrick R**. 2014. Implementing source water protection plans in Saskatchewan: Local watershed perceptions. *Prairie Perspectives* 17: 1-10.

Wang X, **Westbrook C**, Bedard-Haughn A. 2016. Effect of mineral horizons on spatial distribution of soil properties and N cycling in a mountain peatland. *Geoderma* 273:73-82.

Westbrook CJ, Bedard-Haughn A. 2016. Sibbald Research Wetland: Mountain peatland form and ecohydrologic function as influenced by beaver. *The Forestry Chronicle* 92(1): 37-38.

Williams TJ, **Pomeroy JW**, Janowicz JR, Carey SK, Rasouli K, Quinton WL. 2015. A radiative-conductive-convective approach to calculate thaw season ground surface temperatures for modelling frost table dynamics. *Hydrological Processes* 29: 3954-3965. DOI: 10.1002/hyp.10573.

Young K, **Patrick R**. 2015. A planning framework for community-based lakeshore management planning: A case study. *Planning Journal* pp. 4-7.

Yu X, **Guo X**. 2015. Hourly photosynthetically active radiation estimation in Midwestern United States from artificial neural networks and conventional regressions models. *International Journal of Biometeorology* DOI: 10.1007/s00484-015-1120-9.

Technical Reports, Conference Proceeding, Reviews and Other Scholarly Publications

Abonyi S, **Hackett P**, Dyck R. 2016. Editorial: reflections on ethical challenges encountered in Indigenous health research using archival records. *International Journal of Circumpolar Health* DOI.10.3402/ijch. v75.30734Aksamit NO, **Pomeroy JW**. 2015. Saltating snow mechanics: Three species classification from high speed videography. *Proceedings, 72nd Eastern Snow Conference*, pp. 56-77.

Arnold L, Bourassa M, Berdahl L, Fried J, **Bell S**. 2016. Knowledge utilization by policy makers: Is there a role for marketing? *Celebrating America's Pastimes: Baseball, Hot Dogs, Apple Pie and Marketing* 279-283

Engler-Stringer R, Muhajarine N, Ridalls T, Abonyi S, Vatanparast H, Whiting S, **Walker R**. 2016. The Good Food Junction: A community-based food store intervention to address nutritional health inequities, *JMIR Research Protocols* 5(2) e52, DOI: 10.2196/resprot.5303.

Fabrikant S, Raubal M, Bertolotto M, Davies C, Freundschuh S, **Bell S**. 2015. Spatial information theory. *Proceedings of Conference on Spatial Information Theory*.

Guo X et al. 2015. Climate affects grasslands in Canadian prairie and Tibet (CAGPAT). The third post project report. *ISTPCanada Project* 4 pgs.

Leroux NR, **Pomeroy JW**. 2015. A dual pathway heterogeneous flow through snow model. *Proceedings, 72nd Eastern Snow Conference,* pp. 3-14.

Leung W, **Noble BF**. 2016. Taking the pulse on uncertainty in EA: Perspectives about uncertainty location and consideration. *Resilience and Sustainability: Conference proceedings of the International Association for Impact Assessment*, IAIA 2016 Japan. Fargo, ND: International Association for Impact Assessment, 6pgs.

Noble BF, Udofia A. 2015. *Protectors of the Land: Toward an Environmental Assessment Process that Works for Aboriginal Communities and Developers*. Ottawa ON: Macdonald-Laurier Institute.

Paul T, Stanley K, Osgood N, **Bell S**, Muhajarine N. 2016. Scaling behavior of human mobility distributions, *GIScience* - in press.

Pomeroy JW, Fang X, Rasouli K. 2015. Sensitivity of snow processes to warming in the Canadian Rockies. *Proceedings, 72nd Eastern Snow Conference*, pp. 22-33.

Walker R. 2016. Programming public space: The street as set, stage, studio, and gallery, *Curb* magazine 6(2):18-19.

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