



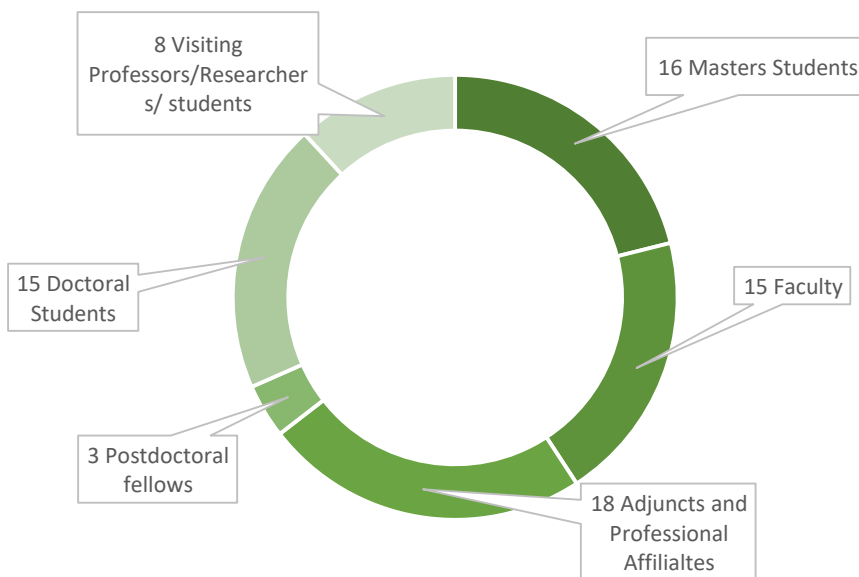
Photo credit: K. Chutko

Department of  
GEOGRAPHY & PLANNING  
RESEARCH ACTIVITY REPORT

2023-2024



## THE DEPARTMENT



## RESEARCH BY THE NUMBERS, 2023-2024



**\$18M** in new external funding

## FACULTY AWARDS AND CREDITS

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**DR. EHAB DIAB**

ADVISING EXCELLENCE AWARD  
MEMBER, NSERC CIVIL, INDUSTRIAL & SYSTEMS ENGINEERING  
EVALUATION GROUP



**DR. ROBERT PATRICK**

MEMBER, SSHRC EXPLORE AND EXCHANGE REVIEW COMMITTEE,  
INTERNAL REVIEWER



**DR. JOHN POMEROY**

CO-CHAIR, UNITED NATIONS ADVISORY BOARD FOR THE  
INTERNATIONAL YEAR OF GLACIERS' PRESERVATION – 2025  
PANEL WITNESS, HOUSE OF COMMONS' STANDING COMMITTEE ON  
ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT (ENVI), AN ACT  
TO ESTABLISH A NATIONAL STRATEGY RESPECTING FLOOD & DROUGHT  
FORECASTING, APRIL 9, 2024 & FOR CLIMATE CHANGE IMPACTS ON  
FRESHWATER, FEB 1, 2024 OTTAWA, CANADA



**DR. CORINNE SCHUSTER-WALLACE**

EXECUTIVE DIRECTOR, GLOBAL INSTITUTE FOR WATER SECURITY,  
USASK  
CHAIR, UNIVERSITY OF SASKATCHEWAN FOOD-WATER NEXUS  
EDUCATION AND TRAINING (FWNET) PROGRAM  
MEMBER, COOPERATIVE INSTITUTE FOR RESEARCH TO OPERATIONS  
IN HYDROLOGY (CIROH), UNIVERSITY OF SASKATCHEWAN

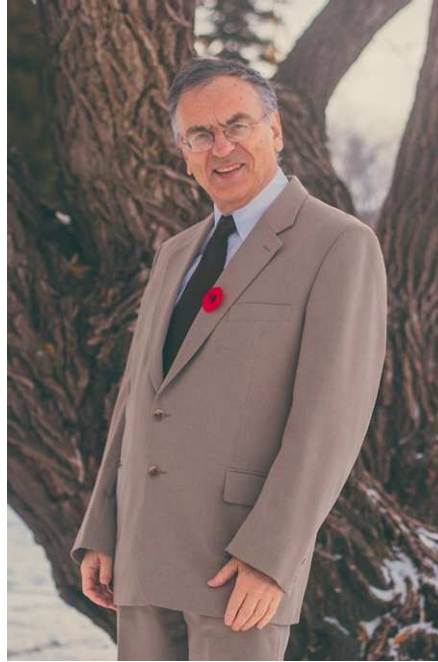


**DR. CHERIE WESTBROOK**

MEMBER, NSERC DISCOVERY GRANTS GEOSCIENCES EVALUATION  
GROUP  
SCIENTIFIC ADVISOR, GOVERNMENT OF YUKON (INVITED) JANUARY  
2024

## Tribute to Dr. Abraham Akkerman on His Retirement

Congratulations! - A well-earned retirement.



Avi began his academic studies in 1968 at the Hebrew University of Jerusalem, Israel, before transferring to Canada to complete his Masters (Calgary, 1976) and then PhD (Waterloo, 1982). Avi worked as a planner for the City of Edmonton before joining the Department of Geography in 1990.

Avi's teaching and research specialization covered an array of topics including demographic analysis, the history of geographic thought as well as European heritage of the built environment. Undergraduate students continue to speak fondly of his many Study Abroad courses to Prague, a city well-known to Avi. Avi contributed to the success of over 40 graduate students in the department serving as supervisor or committee member.

Avi's recognitions outside of the department include Research Fellow at Charles University, Prague, Cornell University, University of Edinburgh, Oxford University and University College of North Wales.

A prolific writer with four sole-authored books on the built environment and European philosophy, *Winter Cities*, *Jane Jacobs and Ebenezer Howard*, and *Philosophical Urbanism*. His numerous book chapters and journal papers covered critical topics in urban planning from winter cities and demographic transitions to urban design and philosophical urbanism. Avi has long proved himself as a thoughtful academic grounded in quantitative methods but also the philosophical understanding of the built environment.

Avi retired from the University of Saskatchewan in 2024 but continues to travel, walk, write, and muse about the challenges of good urbanism. The department will miss his quick humour and friendly presence in the hallway. Good luck, Avi! (*contributor: Dr. Bob Patrick*)



# RESEARCH FUNDING

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, with some faculty having received funding from more than one Tri-Agency. Our research is also funded by a variety of other sources, including industry, governments, not-for-profit organizations, and foundations, reflecting the breadth and interdisciplinary nature of research in the department.

## EXTERNAL FUNDING ANNOUNCEMENTS, 2023-2024

<p><i>Open educational resource development for GEOG 351, GEOG 380</i> GWENNA MOSS CENTRE FOR TEACHING AND LEARNING (\$5,600) AITKEN, A. (PI)</p>	<p><i>Universal childcare and immigrant women's labour outcomes.</i> SSHRC INSIGHT GRANT (\$308,304) DIAB, E. (CO-PI)</p>	<p><i>Linking accessibility measurers to Individuals' behaviour and wellbeing in the Canadian context</i> SSHRC INSIGHT GRANT (\$214,826) DIAB, E. (CO-PI)</p>
<p><i>Improving public transport service ridership through a better understanding of transport accessibility, transit service ...</i> NSERC DISCOVERY GRANT EXTENSION (\$155,000) DIAB, E. (PI)</p>	<p><i>Enhancing woody plant encroachment detection in Grasslands using multi-source earth observation data ...</i> CANADIAN SPACE AGENCY (\$312,000) GUO, X. (PI)</p>	<p><i>Impact of woody plant encroachment on pasture productivity</i> SASK. CATTLEMEN'S ASSOCIATION (\$41,454) GUO, X. (Co-PI)</p>
<p><i>Prairie Landscape Inventory Plus ECCC (EXTENSION) (\$90,000)</i> GUO, X. (PI)</p>	<p><i>Impact Assessment &amp; regulatory frameworks for small modular nuclear reactor deployment</i> SSHRC INSIGHT GRANT (\$276,807) NOBLE, B. (PI)</p>	<p><i>Offshore clean energy projects in Arctic and northern regions</i> COWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA (CIRNAC) (\$42,328) NOBLE, B. (PI)</p>
<p><i>Adaptive Management thresholds in impact assessment</i> IMPACT ASSESSMENT AGENCY OF CANADA (\$71,263) NOBLE, B. (PI)</p>	<p><i>Video, interviews and community tours to document climate change impact</i> PRINCE ALBERT GRAND COUNCIL VIA FIRST NATIONS ADAPT PROGRAM, CANADA (\$60,000) PATRICK, R. (PI)</p>	<p><i>Artificial Intelligence for Snow Cover in Mountain Regions (AI4Snow)</i> DEUTSCHES ZENTRUM FÜR LUFT- UND RAUMFAHRT E.V. (DLR) (\$50,000 EURO) POMEROY, J (PI)</p>
<p><i>Water Towers: Mountains and Glaciers</i> UNESCO IHP (\$3,000 USD) POMEROY, J. (PI)</p>	<p><i>VP Research support for UNESCO Chair in Mountain Water Sustainability</i> OFFICE OF VICE PRESIDENT RESEARCH (\$40,000) POMEROY, J., SCHUSTER-WALLACE, C. (Co-PI)</p>	<p><i>Partnerships for maternal well-being</i> COLLEGE OF ARTS AND SCIENCE (\$5,000) SCHUSTER-WALLACE, C. (PI)</p>
<p><i>RADARSAT Constellation Mission application for data and agreement</i> Global Affairs Canada Guo, X. (PI)</p>	<p><i>Dynamics of integrated socio-environmental systems program. A North American beaver knowledge network USA – NSF</i> TRAVEL FUNDING FOR HUB ACTIVITIES WESTBROOK, C. (Co-PI)</p>	<p><i>Indigenous climate monitoring program</i> CROWN-INDIGENOUS RELATIONS CANADA (\$3,500) PATRICK, R. (PI)</p>

# GRADUATE STUDENT ACHIEVEMENTS 2023-2024

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ALEX CEBULSKI	◆ Dean's Scholarship
ELISE DENNING	◆ JH Richards Scholarship (2024)
MEISAM GHASEDI	◆ Dean's Scholarship
KRISHNA KOLEN	◆ CIHR Canada Graduate Scholarship - Doctorate
KRISHNA KOLEN	◆ Honorary 75 <sup>th</sup> Anniversary Recruitment Scholarship from CGPS
MOHAMED NOURELDIN	◆ 2023 Hantelman Humanities Scholarship
IRINI SOUBRY	◆ Teacher Scholar Doctoral Fellowship (TSDF)

## GRADUATE DEFENDED THESES 2023-2024

- ARMSTRONG, Lucas Jack** (M.Sc.) "Assessing and Reconstructing Community-Scale Weather Variability At Okanese First Nation" (February 2024) Supervisor: Dr. Krys Chutko.
- APATINGA, Gervin Ane** (Ph.D.) "Untapped Connections": The Impact of Water (In) Accessibility And Distant Water Collection on Women's Health and Livelihoods In Rural Northern Ghana" (May 2024)  
Co-Supervisors: Dr. Corinne Schuster-Wallace and Dr. Sarah Dickson-Anderson
- ASANTE, Silas Obeng** (M.Sc.) "Assessing Biomass Energy Resource Potential Near Pelican Narrows, Northern Saskatchewan" (June 2024) Supervisor: Dr. Bram Noble
- BERTONCINI, Andre** (Ph.D.) "Using Enhanced Observations to Improve Streamflow Prediction In Cold Mountain River Basins" (March 2024)  
Supervisor: Dr. John Pomeroy
- FIELD, Brennan Brian** (Ph.D.) "The Mobility of Police-Citizen Interactions Open Data (June 2024) Supervisor: Dr. Jill Blakley.
- ISLAM, S M Didar-UI** (M.Sc.) "Assessing Community Bioenergy Development Potential in Northern and Remote Indigenous Communities" (June 2024)  
Supervisor: Dr. Bram Noble
- LOMBARDI GARBELLINI, Guilherme** (M.Sc.) "Environmental Assessment as A Tool For Managing Impacts on Wetlands: Understanding Current Practice in The Mining Sector" (November 2023) Co-Supervisors: Dr. Bram Noble and Dr. Cherie Westbrook
- LU, Michael** (M.A.) "Understanding the Determinants of X-Minute City Policies and The Differences And Barriers to Achieving X-Minute City Policies" (March 2024)  
Supervisor: Dr. Ehab Diab.
- NOURELDIN, Mohamed** (M.Sc.) "Effect of Transit Systems' Long-Term Disruptions On Travel Behaviour" (September 2023) Supervisor: Dr. Ehab Diab
- SOUBRY, Irini** (Ph.D.) "Monitoring Shrub Encroachment and Its Influencing Factors In Canadian Grasslands with Remote Sensing" (May 2024) Supervisor: Dr. Xulin Guo

# FACULTY

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## ALEC AITKEN, PROFESSOR

ARCTIC MARINE BIOLOGY; QUATERNARY GEOLOGY AND GEOMORPHOLOGY;  
ENVIRONMENTAL HISTORY



## 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, PROFESSOR

REGIONAL PLANNING; NATURAL RESOURCE MANAGEMENT; STRATEGIC  
ENVIRONMENTAL ASSESSMENT; CUMULATIVE EFFECTS ASSESSMENT; PUBLIC SPACE  
DESIGN AND MEASUREMENT; URBAN QUALITY



## KRYSTOPHER CHUTKO, ASSISTANT PROFESSOR

SPATIAL VARIABILITY OF HYDROMETEOROLOGY; WEATHER AND CLIMATE  
MONITORING IN INDIGENOUS COMMUNITIES; PEDAGOGY OF PHYSICAL GEOGRAPHY;  
CURRENT AND PAST VARIABILITY IN TERRESTRIAL AND AQUATIC PROCESSES



## EHAB DIAB, ASSISTANT PROFESSOR

LAND USE AND TRANSPORTATION PLANNING; PUBLIC TRANSIT PLANNING AND  
OPERATIONS; GIS APPLICATION IN PLANNING; TRAVEL BEHAVIOUR, SOCIAL EQUITY  
IN PLANNING.



## XULIN GUO, PROFESSOR, DEPARTMENT HEAD

REMOTE SENSING; INTEGRATING MEASURES OF GRASSLAND FUNCTIONING USING  
REMOTE SENSING; REMOTE SENSING APPLICATIONS FOR LANDSCAPE CHANGE,  
PHYSICAL SYSTEMS AND IN URBAN ENVIRONMENTS



**PAUL HACKETT, ASSOCIATE 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



**BRAM NOBLE, PROFESSOR & VICE DEAN RESEARCH, SCHOLARLY AND ARTISTIC WORKS (COLLEGE OF ARTS AND SCIENCE)**

ENVIRONMENTAL IMPACT ASSESSMENT; RESOURCE POLICY; RESOURCE DEVELOPMENT; WATER RESOURCES MANAGEMENT ENERGY POLICY; ENVIRONMENTAL DECISION MAKING; ABORIGINAL ENGAGEMENT IN RESOURCE DEVELOPMENT



**ROBERT PATRICK, 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, DISTINGUISHED PROFESSOR & UNESCO CHAIR IN MOUNTAIN WATER SUSTAINABILITY**

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



**CORINNE SCHUSTER-WALLACE, ASSOCIATE PROFESSOR, EXECUTIVE DIRECTOR OF THE GLOBAL INSTITUTE FOR WATER SECURITY & UNESCO CHAIR IN MOUNTAIN WATER SUSTAINABILITY**

COUPLED SYSTEMS APPROACHES TO HUMAN HEALTH; CLIMATE CHANGE AND WATER-RELATED DISEASES; GENDER; EQUITY; LOCAL WATER SECURITY IN RURAL COMMUNITIES; WATER AND SUSTAINABLE DEVELOPMENT



**RYAN WALKER, PROFESSOR**

URBAN PLANNING AND GEOGRAPHY; INDIGENOUS URBANISM; PUBLIC SPACE DESIGN AND MEASUREMENT; AGE-FRIENDLY COMMUNITIES; MULTI-LEVEL GOVERNANCE



**CHERIE WESTBROOK, PROFESSOR**

ECOHYDROLOGY OF BEAVER-DOMINATED LANDSCAPES; WETLAND SCIENCE; GROUNDWATER-SURFACE WATER INTERACTIONS OF MOUNTAIN WETLANDS; LINKING SCIENCE TO PRACTICE



# PROFESSOR EMERITUS



**DIRK DeBOER, PROFESSOR EMERITUS**

EROSION MODELS; METAL-SEDIMENT INTERACTIONS IN RIVERS; SEDIMENT AND WATER QUALITY



**LAWRENCE MARTZ, PROFESSOR EMERITUS**

DIGITAL TERRAIN ANALYSIS FOR HYDROLOGICAL MODELING APPLICATIONS; CARTOGRAPHY; HYDROLOGY; GEOMORPHOLOGY; DIGITAL ELEVATION MODELS

# PUBLICATIONS

2023-2024

## EDITED BOOKS & BOOK CHAPTERS IN ALPHABETICAL ORDER

1. Ahmed F, Poelzer G, **Noble B.** 2024. Meaningful participation and energy transitions in the North (Chapter 13). In Van Nijnatten D, Macdonald D. (Eds.) Canadian Environmental Politics and Policy (5th edition). Oxford University Press.
2. **Diab, E.** and Lu, M. (accepted). 15-minute city. The Wiley-AAG International Encyclopedia of Geography (Eds. D. Richardson, N. Castree, M.F. Goodchild, A. Kobayashi, W. Liu & R.A. Marston).
3. **Patrick, R.,** 2023. Integrated Water Resource Planning, 2nd Edition. Kendall Hunt Publishing, Dubuque, IA, USA. ISBN 979-8-3851-0858-9

## JOURNAL PUBLICATIONS IN ALPHABETICAL ORDER

1. Aguirre, I, Hood, GA, **Westbrook, CJ.** 2024. Short-term dynamics of beaver dam flow states. Science of the Total Environment 919: e170825. <https://doi.org/10.1016/j.scitotenv.2024.170825>
2. Ahmed, M.I., Shook, K., Pietroniro, A., Stadnyk, T., **Pomeroy, J.W.,** Pers, C., Gustafsson, D. (2023). Implementing a parsimonious variable contributing area algorithm for the prairie pothole region in the HYPE modelling framework, Environmental Modelling and Software, 167, 105769, DOI: 10.1016/j.envsoft.2023.105769.
3. Annand, H., Wheeler, H.S., **Pomeroy, J.W.** (2024). The influence of roads on depressional storage capacity estimates from high-resolution LiDAR DEMs in a Canadian Prairie agricultural basin, Canadian Water Resources Journal, 49(1), 117-136, DOI: 10.1080/07011784.2023.2235756.
4. Arnal, L., **Schuster-Wallace, C.** (2024). The Virtual Water Gallery: Art as transforming knowledge and behaviour in water and climate. EarthArXiv.
5. Aubry-Wake, C., **Pomeroy, J.W.** (2023). Predicting hydrological change in an alpine glacierized basin and its sensitivity to landscape evolution and meteorological forcings. Water Resources Research, 59(9), e2022WR033363. DOI: 10.1029/2022WR033363.
6. Baijous. W., **Patrick, R.J.** & Furgal, C. Measuring First Nations Engagement in Water Governance in Manitoba. Water 2024, 16(12), 1734. <https://doi.org/10.3390/w16121734> Special Issue. Water Governance: Current Status and Future Trends (June 2024).
7. Brown C., **Noble BF,** Munkittrick. K. 2023. Examination of recent hydroelectric dam projects in Canada for alignment of baseline studies, predictive modelling, and post-development monitoring phases of aquatic environmental impact assessment. Integrate Environ Assess Manage. <https://doi.org/10.1002/ieam.4823>
8. **Chutko, K.J.** and **Guo, X.** 2023. Effects of COVID-19 on first-year undergraduate research in physical geography. Education Sciences, 13(11): 1081
9. Doan, T., Liccioli, S., Sliwinski, M., Samson, C., Biliget, B., Sawatzky, M. & **Guo, X.** (2024).

- Resource Selection Function-Adjusted Carrying Capacity Informs Bison Conservation Management in the Imperial Mixed Grassland Ecosystem. *Rangeland Ecology & Management*, 93(2024): 1-14.
10. Ekanem M, **Noble BF**, Poelzer G, Hans-Kristian H. 2024. Understanding institutional layers and modes of change for energy transitions: Analysis of Norway's electricity sector reforms. *Scandinavian Political Studies* <https://doi.org/10.1111/1467-9477.12267>
  11. Esser, M., Ankley, P., Aubry-Wake, C., Xie, Y., Baulch, H., Hoggarth, C., Hecker, M., Hollert, H., Giesy, J.P., **Pomeroy, J.W.**, Brinkmann, M. (2024). A preliminary investigation of microbial communities on the Athabasca Glacier within deposited organic matter. *Environmental Science: Advances*, 3, 355-365, DOI: 10.1039/D3VA00176H.
  12. Fairfax E, **Westbrook C.** 2024. The ecology and evolution of beavers: ecosystem engineers that ameliorate climate change. *Annual Review of Ecology, Evolution, and Systematics* 55: <https://doi.org/10.1146/annurev-ecolsys-102722-122317> Fawcett, R B, **Walker, R**, Belanger, Y (2024) Liminal spaces and structural limitations of First Nation urban reserves, *International Indigenous Policy Journal* 15(1) <https://doi.org/10.18584/iipj.2024.15.1.16311>
  13. Fawcett, R B, **Walker, R**, Belanger, Y (2024) Liminal spaces and structural limitations of First Nation urban reserves, *International Indigenous Policy Journal* 15(1) <https://doi.org/10.18584/iipj.2024.15.1.16311>
  14. Harder, P., Helgason, W.D., Johnson, B., **Pomeroy, J.W.** (2023). Crop water use efficiency from eddy covariance methods in cold water-limited regions, *Agricultural and Forest Meteorology*, 341, 109657, DOI: 10.1016/j.agrformet.2023.109657.
  15. He, Z., Shook, K., Spence, C., Pomeroy, J.W., Whitfield, C. (2023). Modelling the regional sensitivity of snowmelt, soil moisture, and streamflow generation to climate over the Canadian Prairies using a basin classification approach, *Hydrology and Earth System Sciences*, 27(19), 3525–3546. DOI: 10.5194/hess-27-3525-2023.
  16. He, Z., **Pomeroy, J.W.** (2023). Assessing hydrological sensitivity to future climate change over the Canadian southern boreal forest, *Journal of Hydrology*, 624, 129897, DOI: 10.1016/j.hydrol.2023.129897.
  17. Jaradat, A., **Noble, B.**, Poelzer, G. 2024. Youth as energy citizens or passive actors? A critical review of energy transition scholarship. *Energy Research and Social Science*. <https://doi.org/10.1016/j.erss.2023.103405>
  18. Javanmard, R., Lee, J., Kim, K., Park, J., & **Diab, E.** (2024). Evaluating the impacts of supply-demand dynamics and distance decay effects on public transit project assessment: A study of healthcare accessibility and inequalities. *Journal of Transport Geography*, 116, 103833. Doi: <https://doi.org/10.1016/j.jtrangeo.2024.103833>
  19. Kolen, K.A. and **Chutko, K.J.** 2023. The relationship between wildfires and respiratory health: AQHI data in southern Saskatchewan and its potential respiratory implications. *University of Saskatchewan Undergraduate Research Journal*, 9(1). doi: 10.32396/usurj.v8i2.654.
  20. Lam, J., Jayaram, S., NG, W., & **Diab, E.** (2024). Exploring gender differences in awareness of new active transportation projects: Réseau Express Vélo (REV) case study. *Journal of Cycling and Micromobility Research (New Journal)*, 2, 100035. Doi: <https://doi.org/10.1016/j.jcmr.2024.100035>
  21. Li, X., Fan, Z., Sha, J., **Guo, X.**, Zheng, C., Shifaw, E. & Wang, J. (2024). The comparative study of urban ecosystem health change in Asian and African coastal cities—Change in China and Suez in Egypt. *Ecological Indicators*, 159(2024): 1-12.
  22. Lim B, Poelzer G, **Noble BF.** 2024. Social value of renewable energy in remote, northern, Indigenous communities. *Journal of Aboriginal Economic Development*.
  23. Lu, X., Owens-Beek, N., McKay, R., Webb, J., **Guo, X.** & Natcher, D. (2024). Forecasting

- Industrial Induced Tipping Points in First Nations' Land Use in Northeast British Columbia. *Extractive Industries and Society*, 17(2024): 1-12.
24. McClelland, C., Chételat, Conlan, K., **Aitken, A.**, Forbes, M. and Majewski, A. 2024. Methylmercury dietary pathways and bioaccumulation in Arctic benthic invertebrates of the Beaufort Sea. *Arctic Science* (January 2024)
  25. McMaster R, **Noble BF**, Poelzer 2024. Assessing local capacity for community appropriate sustainable energy transitions in northern and remote Indigenous communities. *Renewable & Sustainable Energy Reviews*. <https://doi.org/10.1016/j.rser.2023.114232>
  26. Mu, Y., Jia, X., Zha, T. & **Guo, X.** et al. (Accepted). Vegetation factors and atmospheric dryness regulate the dynamics of ecosystem water use efficiency in a temperate semiarid shrubland, *Journal of Hydrology* (June 20, 2024).
  27. Mu, Y., Jia, X., Ye, Z., Zha, T., **Guo, X.**, Black, T.A., Zhang, Y. Hao S., Han, C., Gao, S., Qin, S., Liu, P. & Tian, Y. (2024). Dry-season length affects the annual ecosystem carbon balance of a temperate semi-arid shrubland. *Science of the Total Environment (STOTEN)*, 917(2024): 1-10.
  28. Noureldin, M. G., & **Diab, E.** (2024). Understanding the effects of a long-term transit service suspension during the COVID-19 pandemic on transit users' travel choices. *Case Studies on Transport Policy*, 101223. Doi: <https://doi.org/10.1016/j.cstp.2024.101223>
  29. Patterson, C., Torres, A., Coroi, M., Cumming, K., Hanson, M., **Noble, B.F.**, Tabor, G.M., Treweek, J., Iglesias-Merchan, C., Jaeger, J.A.G.(2023): Pathways for improving the consideration of ecological connectivity in environmental assessment: Lessons from five case studies. *Impact Assessment and Project Appraisal*, in press. <https://doi.org/10.1080/14615517.2023.2246727>
  30. Pu, Y., Wilmschurst, J. & **Guo, X.** (2024). Separating shrub cover from green vegetation in grasslands using hyperspectral vegetation indices. *Canadian Journal of Remote Sensing*, 50(1): 1-17.
  31. Rohanizadegan, M., Petrone, R.M., **Pomeroy, J.W.**, Kosovic, B., Muñoz-Esparza, D., Helgason, W.D. (2023). High-resolution large-eddy simulations of flow in the complex terrain of the Canadian Rockies. *Earth and Space Science*, 10(10), e2023EA003166. DOI: 10.1029/2023EA003166.
  32. Rowe, A., M., **Schuster-Wallace, C.** (2023). Implementing EDI across a large formal research network: Contributing to equitable and sustainable water solutions for a changing climate. *Geoforum*, 147
  33. Schultz, J., Baijous, W. and **R. Patrick**. 2023. Water for Life in Alberta, Canada: Assessing First Nations Engagement. *Canadian Planning and Policy Journal*. <https://doi.org/10.24908/cpp-apc.v2023i1.15685>
  34. Staines, J., **Pomeroy, J.W.** (2023). Influence of forest canopy structure and wind flow on patterns of sub-canopy snow accumulation in montane needleleaf forests. *Hydrological Processes*, 37(10), e15005. DOI: 10.1002/hyp.15005.
  35. Whitfield, C.J., Cavaliere, E., Baulch, H.M., Clark, R.G., Spence, C., Shook, K.R., He, Z., **Pomeroy, J.W.**, Wolfe, J.D. (2024). An integrated assessment of impacts to ecosystem services associated with prairie pothole wetland drainage quantifying wide-ranging losses, *Facets*, 9, DOI: 10.1139/facets-2023-0207.
  36. Winters, M., Fuller, D., Cloutier, M-S, Harris, M.A., Howard, A., Kestens, Y., Kirk, S, Macpherson, A., Moore, S, Rothman, L., Shareck, M., Tomasone, J.R., Laberee, K., Poirier Stephens, Z., Sones, M., Ayton, D., Batomen, B., **Bell, S.**, Collins, P.A., Diab, E., Giles, A.R., Hagel, B.E., Harris, M.S., Harris, P., Lachapelle, U., Manaugh, K., Mitra, R., Muhajarine, N.,

- Muller Myrdahl, T., Pettit, C.J., Pike, I., Skouteris, H., Wachsmuth, D., Whitehurst, D. & Beck, B. April 2024. Building CapaCITY/É for Sustainable Transportation: Protocol for an Implementation Science Research Program in Healthy Cities. BMJ Open. <https://doi.org/10.1136/bmjopen-2024-085850>
37. Xing, F., An, R. **Guo X.** & Shen, X. (2024). Mapping the continuous cover of invasive noxious weed species in alpine grassland ecosystems using Sentinel-2 imagery and a novel convolutional neural network regression model. Remote Sensing, 2024(16): 1-23.
  38. Xing, F., An, R., **Guo, X.** & Shen, X. (2024). Mapping invasive noxious weed species in the alpine grassland ecosystems using very high spatial resolution UAV hyperspectral imagery and a novel deep learning model GIScience Remote Sensing. GIScience and Remote Sensing, 61(1): 1-26.
  39. Zemichael, Workneh, Eunice, Salub, Alain, Pietroniro. & **Corinne J. Schuster-Wallace.** Impacts of climate change on water-related mosquito-borne diseases in temperate regions: A systematic review of literature and meta-analysis. Acta Tropica.

## OTHER SCHOLARLY PUBLICATIONS (TECHNICAL REPORTS, CONFERENCE PROCEEDINGS, REVIEWS) IN ALPHABETICAL ORDER

1. Asante S., Islam D, Shah T, Poelzer G, **Noble BF.** 2023. Assessment of biomass energy resource potential and opportunity: Pelican Narrows, Peter Ballantyne Cree Nation. University of Saskatchewan: Community Appropriate Sustainable Energy Security (CASES) Partnership
2. Asante S., Islam D, Shah T, Poelzer G, **Noble BF.** 2023. Assessment of biomass energy resource potential and opportunity: Southend, Peter Ballantyne Cree Nation. University of Saskatchewan: Community Appropriate Sustainable Energy Security (CASES) Partnership.
3. Cooper DJ, Schweiger EW, Shaw JR, **Westbrook CJ,** Kaczynski K, Rathburn S, & Chimner RA. (2023). Riparian ecosystem condition assessment of the Kawuneeche Valley. Kawuneeche Valley Research Collaborative, 63 p. (Report)
4. Finlayson, J.M. and **Chutko, K.J.** 2024. Spatial and temporal variability of 2023 hail precipitation in Calgary, Alberta, Canada. Presented at the 80th Eastern Snow Conference, Waterloo, ON, Canada, June 4-6, 2024.
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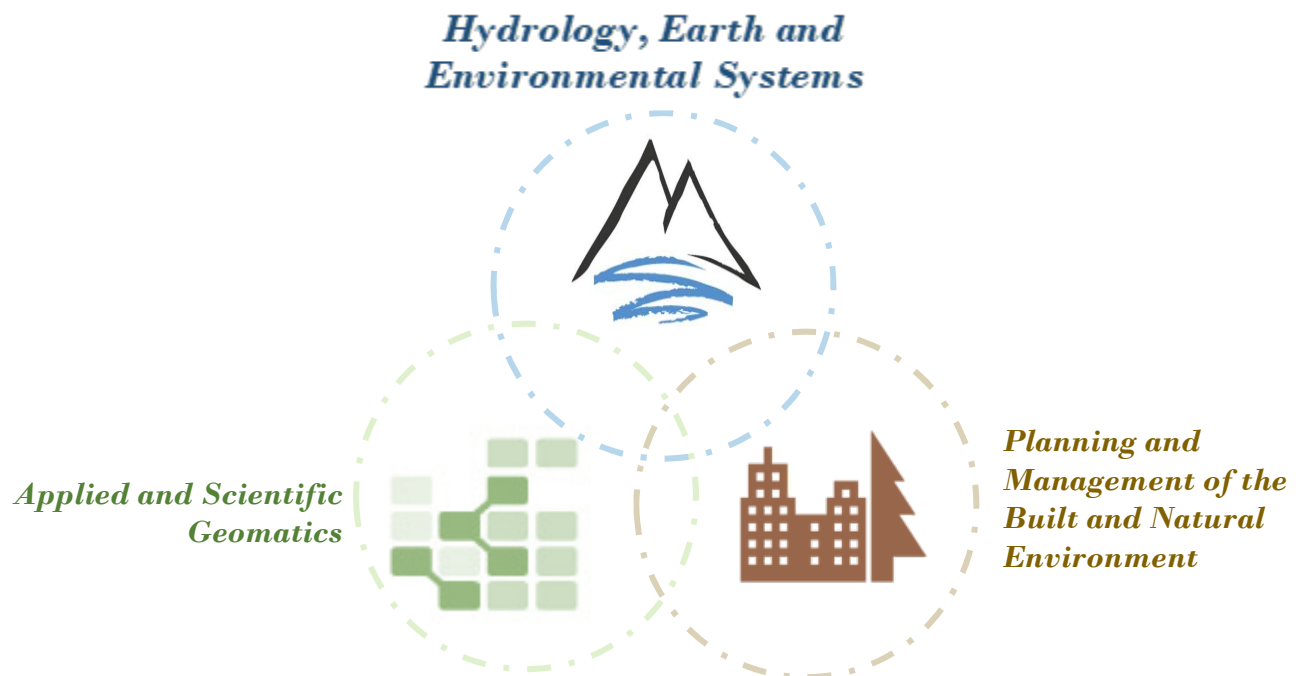
# RESEARCH MISSION AND VALUES

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 through 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 crosscutting, 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, erosion modeling and fluvial sediment flexes, wetland science, and ecohydrology.

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.

GEPL provides the leadership for the Global Institute for Water Security and Water Signature Theme Area at the University of Saskatchewan through the Executive Director, Dr. Corinne Schuster-Wallace.

Our department is home to the Centre for Hydrology, the UNESCO Chair in Mountain Water Sustainability, the Director of the CFREF-funded Global Water Futures program – the largest university-led freshwater research program in the world - and the new CFI-funded Global Water Futures Observatories facility of pan-Canadian water research basins and laboratories. The Centre for Hydrology currently manages much of its research relating to mountain hydrology, ecohydrology and prediction at the Coldwater Laboratory in Canmore, Alberta, and its research on Canadian Prairie hydrology, hydrological modelling and drone remote sensing applications at Environment and Climate Change Canada's National Hydrology Research Centre on campus.

## Some of our current research projects include:

- Rocky Mountain water supply resilience and vulnerability evaluation
- Simulation of prairie small-basin hydrology and soil erosion
- Hydrological prediction for flood hazard mapping
- Hydrological response to changing climate in the Mackenzie and Yukon River basins
- Developing advanced mountain snowpack products using remote sensing, physically based modelling and artificial intelligence-based inference
- Assessing community structure of marine benthos, Canadian Arctic Archipelago
- Landscape form and ecohydrological function alteration by beavers

- Assessment of PAH distributions in sediments in the oil sands monitoring area and western Lake Athabasca



## 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 to 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.

### Key research projects include:

- Integrating measures of grassland function using Remote Sensing
- Prairie Landscape Inventory Plus
- Strategic Environmental Assessment application for landscape-based, temporal analysis of wetland change in urban environments
- Detecting spatial and temporal changes in land cover on Aboriginal reserves
- Visualizing & communicating urban and transposition spatiotemporal data
- Measuring the impacts of long-term public transport service disruptions and the effectiveness of mitigation strategies.
- Establishing functional relationship between public transit ridership and local and regional accessibility measures.



## 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, transportation system performance, sustainable cities, municipal governance, Indigenous health, indigenous urbanism, and human behavior and navigation. Research also occurs on natural resources planning and management, including exploring human interactions with the natural environment using applied geomatics and other analytical tools. Included is research on watershed planning and management, flood risk management, environmental policy and planning, land use and transportation systems interactions, 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, including the School of Environment and Sustainability, Johnson-Shoyama Graduate School of Public Policy, and the Saskatchewan Population Health and Evaluation Research Unit.

**Some of our current research projects include:**

- Source water protection planning with First Nations in Saskatchewan
- Food security in regional strategic environmental assessment
- Creating demand for a downtown lifestyle in Saskatoon
- Indigenous health policy network analysis of northern Saskatchewan
- Health risks associated with private drinking water well use
- Establishing First Nation indicators of health and wellbeing
- Developing coupled system approaches to water-related health
- Women and water fetching in rural Uganda and Ghana
- Watershed and habitat protection planning with First Nations
- Climate change adaptation planning with First Nations
- Exploring the concept of '15-minute city' and its application in Canada
- Sustainable industrial neighbourhood design
- Transportation planning & Public Transit efficiency
- Advanced urban design





Photo credit: Dr. Ehab Diab

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Let's stay connected!



Join our Instagram community using the above QR code to stay updated on hydrology happenings and opportunities.