

M. Derek MacKenzie

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Area of Research Expertise

My research interest lies in ecosystem ecology, soil science, and agricultural soil health, with a particular focus on the role of black carbon in soils and its applications in agriculture and forestry. My expertise includes, soil biogeochemistry, ecosystem ecology, land reclamation, agricultural soil health, data science applications in agriculture, fire ecology and black carbon, and stable isotopes in the environment.

Education and Training

Ph.D. Forestry. April 2004, The University of Montana. Dissertation: Fire exclusion, forest dynamics and nitrogen cycling in low elevation forests of western Montana.

M.Sc. Geography. May 1999, Simon Fraser University. Thesis: The effect of mechanical site preparation on soil properties, nutrient dynamics and tree growth: Tenth year results for two sites in northern BC.

B.Sc. Environmental Geography. May 1996, Concordia University. Honors Thesis: A comparison between the growth rates of artificially and naturally regenerated tree species.

Employment History

2017 to present: Associate Professor, Soil-Plant Relations, University of Alberta. Faculty position to teach and conduct research in soil-plant relations, soil mediated plant nutrient cycling, disturbance ecology, and agricultural soil health. Teaching assignment: RENR 210 – Introduction to Soil Science; RENR 305 – Land Reclamation Practices and Principles.

2010 to 2017: Assistant Professor, Soil-Plant Relations, University of Alberta. Faculty position to teach and conduct research in soil-plant relations, soil mediated plant nutrient cycling, disturbance ecology, and land reclamation. Teaching assignment: RENR 210 – Introduction to Soil Science; RENR 366 – Restoration Ecology (co-taught), RENR 299 – Summer Field School (Instructor).

2008 to 2010: Research Associate, Soil Biogeochemistry, University of Alberta. Supervisor: Dr. Sylvie Quideau. Research position to design and conduct experiments and field observations on land reclamation in the Athabasca oil sands focusing on inorganic plant nutrient turnover and ecosystem recovery, and to co-supervise graduate students, undergraduate students, and lab technicians.

2006 to 2008: Post-Doctoral Fellow, Soil Biogeochemistry, University of Alberta. Supervisor: Dr. Quideau. Post-doctoral research position to collect samples and perform experiments examining soil chemistry, microbial community structure, and plant dynamics in land reclamation, and supervision of graduate students, field and lab technicians.

2005 to 2006: Post-Doctoral Fellow, Soil Biogeochemistry, joint position with the University of California and the University of Alberta. Supervisors: Dr. Robert Graham and Dr. Quideau.

Post-doctoral research position to collect samples and develop laboratory experiments to determine the quantity and spatial variability of charcoal, to test the quality of organic matter formed in the presence of charcoal in different ecosystems of the Sierra Nevada, California, supervision of graduate students, field and lab technicians.

2004 - 2005: Post-Doctoral Fellow, Forest Soils, University of Montana. Supervisors: Dr. Thomas DeLuca and Dr. William Holben. Post-doctoral research position where I developed experiments to test the effect of charcoal and fire frequency on microbial dynamics, managed the soil analytical lab, supervised lab and field technicians, and collected field samples.

2000 - 2004: Research Assistant, Forest Soils, University of Montana. Supervisor: Dr. DeLuca. Collected field samples and conducted laboratory research on N cycling and plant community dynamics with increasing time since fire, managed the soil analytical lab, supervised lab and field technicians and TA Introduction to Soil Science.

1999 - 2000: Sessional instructor of Biogeography and Soil Science, Simon Fraser University. Supervisor: Dr. Ian Hutchinson. One semester appointments respectively to develop and teach the two courses listed above, supervise teaching assistants, examine and grade undergraduate students.

1996 - 1998: Research Assistant, Soil Science, Simon Fraser University. Supervisor: Dr. Margaret Schmidt. Conducted field work with assistants, monitored and collected soil samples from mechanical site preparation treatments at silvicultural sites established by the Ministry of Forests, BC, analyzed soil physical and chemical properties, and TA Introduction to Soil Science, Biogeography and Biogeochemistry.

Awards and Scholarships

1. 2023 Nominated for the Faculty of Agricultural, Life, and Environmental Sciences Graduate Student Supervision Award
2. 2004 National Science Foundation Bursary, College of Forestry, University of Montana
3. 2003 Student Presentation Award, Canadian Soil Science Society Annual Meeting, Montreal, QC
4. 2003 Author Presentation Award, Soil Science Society of America Annual Meeting, Denver, CO
5. 2000 National Science Foundation Bursary, College of Forestry, University of Montana
6. 2000 McIntire-Stennis Fellowship, College of Forestry, University of Montana
7. 1998 GREAT grant, Geography Department, Simon Fraser University
8. 1996 Graduate Fellowship, Geography Department, Simon Fraser University

9. 1995 Undergraduate Bursary, Geography Department, Concordia University

Undergraduate Teaching

Assistant and Associate Professor

1. RENR 210 Introduction to Soil Science. 2011 to present, Renewable Resources, University of Alberta
2. RENR 305 Practices and Principles of Land Reclamation. 2023 to present, Renewable Resources, University of Alberta
3. RENR 290 Summer Field School. 2020 to 2021, as Academic co-lead, 2022 as Academic lead, 2023 as instructor, Renewable Resources, University of Alberta
4. RENR 299 Spring Field School. 2016 to 2019 as Academic lead (second half), 2010 to 2015 as instructor, Renewable Resources, University of Alberta
5. RENR 366 Restoration Ecology. 2015 to 2018, Renewable Resources, University of Alberta
6. RENR 307 Environmental Assessment. Winter 2013 to 2017, Renewable Resources, University of Alberta
7. SOILS 430 Soil Microbiology and Biogeochemistry. 2010 to 2012, Renewable Resources, University of Alberta

Sessional Instructor

1. SOILS 450 Environmental Soil Chemistry. Winter 2008, Renewable Resources, University of Alberta
2. GEOG 215 Biogeography. Winter 2000, Geography Department, Simon Fraser University
3. GEOG 317 Introduction to Soil Science. Winter 1999, Geography Department, Simon Fraser University

Teaching Assistant

1. RENR 595 Special Topic: Advanced Soil Analytical Techniques. Fall 2005, University of Alberta.
2. FOR 350 Introduction to Soil Science. Fall 2001, 2002, 2003, The University of Montana.
3. GEOG 316 Biogeochemistry. Fall 1999, Simon Fraser University.
4. GEOG 317 Introduction to Soil Science. Spring 1998, Simon Fraser University.

5. GEOG 111 Introduction to Physical Geography. Fall 1998, Simon Fraser University.
6. GEOG 215 Biogeography. Fall 1996, Simon Fraser University.

Guest Lectures

1. RENR 401 Disturbance Ecology. Lecture: Fire, Soil, and Vegetation: Chemical Interactions. 2008 to 2013, Renewable Resources, University of Alberta.
2. SOILS 430 Environmental Microbiology and Biochemistry. Lecture: The Nitrogen Cycle. 2006 and 2007, Renewable Resources, University of Alberta.
3. FOR 330 Forest Ecology. Lecture: Fire and Nitrogen Dynamics. Spring 2005, Department of Biology, The University of Montana.
4. FOR 415 Environmental Soil Science. Lecture: The Nitrogen Cycle. Fall 2004, Department of Forest Science, The University of Montana.

Publishing philosophy and peer-reviewed research publications

Graduate students at the University of Alberta experience a positive and engaging learning environment, and publishing peer-reviewed articles is part of the experience. I supervise, co-supervise, or serve on the supervisory committee of many students and in all cases, graduate students are given first authorship of their work, with the primary supervisor as either the second or last author. Therefore, as the supervisor of graduate student work, I have initially conceived, funded, supervised, and edited the students work.

Journal Articles

Underlined authors represent graduate students:

50. JA Cabrera-Hernandez, H Davidson, MD MacKenzie, BD Lanoil. 2025. Impact of stockpiling on soil fungal communities and their functions. *Restoration Ecology*, <https://doi.org/10.1111/rec.14333>
49. X Wu, MD MacKenzie, J Yang, G Lan, Y Liu. 2025. Climate Change Drives Changes in the Size and Composition of Fungal Communities Along the Soil–Seedling Continuum of *Schima superba*. *Molecular Ecology*, <https://doi.org/10.1111/mec.17652>
48. Krzic, M., T. Yates, A. Dichon, L. Van Eerd, and MD. MacKenzie. 2024. Assessing the Incorporation of the Soil Health Concept in Postsecondary Education in Canada. *Canadian Journal of Soil Science* 104: 227–236
47. Santana-Martinez, JC., AM. Aguirre-Monroy, MD. MacKenzie, and BD. Lanoil. 2024. The impact of reclamation and vegetation removal on compositional and functional attributes of soil microbial communities in the Athabasca Oil Sands Region. *Applied Soil Ecology* 198, 105368

46. Hernandez, J.A.C., H.M. Ribeiro, E. Bayne, M.D. MacKenzie, and B.D. Lanoil. 2024. Impact of stockpile depth and storage time on soil microbial communities. *Applied Soil Ecology* 196, 105275
45. Khodaei, H., C. Álvarez-Bermúdez, S. Chapela, C. Olson, and M.D. MacKenzie. 2024. Eulerian CFD simulation of biomass thermal conversion in an indirect slow pyrolysis rotary kiln unit to produce biochar from recycled waste wood. *Energy* 288, 129895
44. Weber, T., G. Hernandez Ramirez, S. Quideau, M.D. MacKenzie. 2024. Biochar–manure impacts wheat and canola grain productivity, dry matter partitioning, and protein content in western Canada. *Soil Science Society of America Journal* 88, 109-125
43. Schoonmaker, A.L., A. Mathison, M.D. Mackenzie. 2023. Hitchhiker planting: mixed-species container stock planting as a novel tool to increase plant diversity on industrially disturbed sites. *Canadian Journal of Forest Research* 53, 905-921
42. Weber, T.L., G. Hernandez-Ramirez, S. Quideau, M.D. MacKenzie. 2023. Biochar and Manure from Cattle Fed Biochar as Agricultural Amendments Alter CH₄ Oxidation in a Gray Luvisol. *Land* 12, 1353
41. Rojas, L.M., S.T. Dietrich, M.D. MacKenzie, and B.D. Pinno. 2022. Buried wood effects on macronutrient supply and microbial activity and metabolic potential in different oil sands reclamation soils in northern Alberta. *Canadian Journal of Soil Science*, 103, 249-258
40. Heffernan, L., V.E.J Jassey, M. Frederickson, M.D. MacKenzie, D. Olefeldt. 2021. Constraints on potential enzyme activities in thermokarst bogs: Implications for the carbon balance of peatlands following thaw. *Global Change Biology* 27: 4711-4726
39. Weber, T.L., C.M. Romero, M.D. MacKenzie. 2021. Biochar–manure changes soil carbon mineralization in a Gray Luvisol used for agricultural production. *Canadian Journal of Soil Science* 102: 225-229
38. Hogberg J.I., M.D. MacKenzie, and B.D. Pinno. 2020. Using a nutrient profile index to assess reclamation strategies in the Athabasca oil sands region of northern Alberta. *Journal of Environmental Quality*. 49: 61-73
37. Lalonde, R., B. Pinno, N. Utting, and M.D. Mackenzie. 2020. Woody Plant Growth in Oil Sands Tailings with Varying Capping Depths and Soil Types. *Canadian Journal of Soil Science*.100: 546-557
36. Hogberg, J.I., B.D. Pinno, and M.D. MacKenzie. 2020. Evaluating foliar nutrient concentration as an indicator of soil nutrients in reclaimed and natural forests in Alberta, Canada. *International Journal of Mining, Reclamation and Environment*. 34: 75-87
35. MacKenzie, M.D. and S.T. Dietrich. 2020. Atmospheric sulfur and nitrogen deposition in the

Athabasca oil sands region is correlated with foliar nutrient levels and soil chemical properties. *Science of The Total Environment*, 134737

34. Hemsley, T.L., M.D. MacKenzie, and S.A. Quideau. 2019. Ecophysiological response of aspen (*Populus tremuloides*) and jack pine (*Pinus banksiana*) to atmospheric nitrogen deposition on reconstructed boreal forest soils in the Athabasca oil sands region. *Science of The Total Environment* 696, 133544
33. Ralston, A., G. Hernandez, M. Dyck, M.D. MacKenzie, and S.A. Quideau. 2019. Mobile learning and student engagement in remote field activities. *First Monday* 24 (11)
32. deBortoli, L.A., B.D. Pinno, M.D. MacKenzie, and E.H.Y. Li. 2019. Plant community composition and tree seedling establishment in response to seeding and weeding treatments on different reclamation cover soils. *Canadian Journal of Forest Research* 49: 836-843
31. Dietrich, S.T. and M.D. MacKenzie. 2019. Comparing spatial heterogeneity of bioavailable nutrients and soil respiration in boreal sites recovering from natural and anthropogenic disturbance. *Frontiers in Environmental Science* 6, 126
30. Dietrich, S.T., and M.D. MacKenzie. 2018. Biochar affects aspen seedling growth and reclaimed soil properties in the Athabasca oil sands region. *Canadian Journal of Soil Science*. 98: 519-530.
29. Dietrich, S.T., M.D. MacKenzie, J. P. Battigelli, and J. R. Enterina. 2017. Building a better soil for upland surface mine reclamation in northern Alberta: Admixing peat, subsoil, and peat biochar in a greenhouse study with aspen. *Canadian Journal of Soil Science*:1-14.
28. Howell, D.M. and M.D. MacKenzie. 2017. Measuring ecosystem function to assess reclamation success: Nutrient and microbial profiles. *Applied Soil Ecology*. 116: 87-95.
27. Sorenson, P., M.D. MacKenzie, S.A. Quideau, and S. Landhäusser. 2017. Spatial patterns in reclaimed stands in the Athabasca oil sands region. *Ecological Engineering*. 104:57-66.
26. Das Gupta, S. and M.D. MacKenzie. 2016. Spatial variability of soil respiration in pyrogenic boreal aspen ecosystems: Aboveground and belowground controls. *PLOS One* 11:e0165602, doi: 10.1371/journal.pone.0165602
25. Howell, DM., S. Das Gupta, B. D. Pinno, and M. D. MacKenzie. 2016. Reclaimed soils, fertilizer, and bioavailable nutrients: Determining similarity with natural benchmarks over time. *Canadian Journal of Soil Science*, 97: 149-158
24. Samrat Alam, M., M. Cossio, L. Robinson, X. Wang, J. P. L. Kenney, K. O. Konhauser, M. D. MacKenzie, Y. S. Ok, and D. S. Alessi. 2016. Removal of organic acids from water using biochar and petroleum coke. *Environmental Technology & Innovation* 6:141-151.

23. Das Gupta, S., M.D. MacKenzie, and S.A. Quideau. 2015. Using Spatial Ecology to Examine Above and Belowground Interactions on a Reclaimed Aspen Stand in Northern Alberta. *Geoderma*, 260:12-22.
22. Soucémariadin, LN., S.A. Quideau, M.D. MacKenzie, A.D. Munson, Juliette Boiffin, G.M. Bernard, R.E. Wasylishen. 2015. Total and pyrogenic carbon stocks in black spruce forest floors from eastern Canada. *Organic Geochemistry*, 82:1-11.
21. Pinno, B. D., S. M. Landhäusser, P. S. Chow, S.A. Quideau, and M.D. MacKenzie. 2014. Nutrient uptake and growth of fireweed (*Chamerion angustifolium*) on reclamation soils. *Canadian Journal of Forest Research*, 44:1-7.
20. Soucémariadin, LN., S. A. Quideau, and M.D. MacKenzie. 2014. Pyrogenic carbon stocks and storage mechanisms in podzolic soils of fire-affected Quebec black spruce forests. *Geoderma* 217–218:118-128.
19. Soucémariadin, LN., S. A. Quideau, M.D. MacKenzie, G. M. Bernard, and R. E. Wasylishen. 2013. Laboratory charring conditions affect black carbon properties: A case study from Quebec black spruce forests. *Organic Geochemistry*, 62:46-55.
18. Quideau, S. A., S. D. Gupta, M. D. MacKenzie, and S. M. Landhäusser. 2013. Microbial Response to Fertilization in Contrasting Soil Materials used during Oil Sands Reclamation. *Soil Sci. Soc. Am. J.* 77:145-154.
17. MacKenzie, M.D. and S. A. Quideau. 2012. Laboratory Based Nitrogen Mineralization and Biogeochemistry of Two Soils Used in Oilsands Reclamation. *Canadian Journal of Soil Science*, 92: 131-142.
16. Pinno, B.D., S.M. Landhausser, M.D. MacKenzie, S.A. Quideau, And P.K. Chow. 2012. Trembling Aspen Seedling Establishment, Growth, and Response to Fertilization on Contrasting Soils used in Oilsands Reclamation. *Canadian Journal of Soil Science*, 92: 143-151.
15. Sorenson, P.T., S. A. Quideau, M.D. MacKenzie, S. M. Landhäusser, and S. W. Oh. 2011. Forest floor development and biochemical properties in reconstructed boreal forest soils. *Applied Soil Ecology* 49:139-147.
14. Ball, P.N., M.D. MacKenzie, W.E. Holben and T.H. DeLuca. 2010. Wildfire and charcoal enhance nitrification and ammonium oxidizing bacterial abundance in dry montane forest soils. *Journal of Environmental Quality*, 39:1243-1253.
13. MacKenzie, M.D. and S.A. Quideau. 2010. Microbial Community Structure and Nutrient Availability in Oil Sands Reclaimed Boreal Soils. *Applied Soil Ecology*, 44: 32-41.
12. Swallow, M., S.A. Quideau, M.D. MacKenzie and B. Kischuk. 2009. Microbial community structure and function: Effects of prescribed burning and topographic position. *Soil Biology and Biochemistry*, 41: 770-771.

11. Norris C.E., S.A. Quideau, J.S. Bhatti, R.E. Wasylishen, and M.D. MacKenzie. 2009. Fire and harvest influence on jack pine soil organic carbon. *Canadian Journal of Forest Research*, 39: 642-654.
10. MacKenzie, M.D., E.J.B. McIntire, S.A. Quideau and R.C. Graham. 2008. Charcoal affect C and N contents in forest soils of Sierra Nevada, California. *Soil Science Society of America Journal*, 72: 1774-1785.
9. McMillan, R., S.A. Quideau, M.D. MacKenzie and O. Biryukova. 2007. Nitrogen Mineralization and Microbial Activity in Reclaimed Boreal Forest Soils. *Journal of Environmental Quality*, 36: 1470-1478.
8. Kurth, V.J., M.D. MacKenzie and T.H. DeLuca. 2006. Estimating charcoal content in forest mineral soils. *Geoderma*, 137: 135-139.
7. MacKenzie, M.D. and T.H. DeLuca. 2006. Resin adsorption of carbon and nitrogen as influenced by season and time since fire. *Soil Science Society of America Journal*, 70: 2122-2129.
6. MacKenzie, M.D. and T.H. DeLuca. 2006. Charcoal and shrubs modify soil processes in ponderosa pine forests of western Montana. *Plant and Soil*, 287: 257-266.
5. MacKenzie, M.D., T.H. DeLuca and A. Sala. 2006. Fire exclusion and nitrogen mineralization in low elevation forests of western Montana. *Soil Biology and Biochemistry*, 38: 952-961.
4. DeLuca, T.H., M.D. MacKenzie and M.J. Gundale. 2006. Charcoal enhances nitrification in forest ecosystems. *Soil Science Society of America Journal*, 70: 448-453.
3. MacKenzie, M.D., M.G. Schmidt and L. Bedford. 2005. Soil microclimate and N availability ten years after mechanical site preparation in northern British Columbia. *Canadian Journal of Forest Research*, 35: 1854-1866.
2. Hart, S.C., T.H. DeLuca, G.S. Newman, M.D. MacKenzie and S.I. Boyle. 2005. Post-fire vegetation dynamics as drivers of microbial community structure and function in forest soils. *Forest Ecology and Management*, 220: 166-184.
1. MacKenzie, M.D., T.H. DeLuca and A. Sala. 2004. Forest structure and organic horizon analysis along a fire chronosequence in the low elevation forests of western Montana. *Forest Ecology and Management*, 203: 331-343.

Refereed Book Chapters

4. Deluca, T.H., Gao, S., M.J. Gundale, M.D. MacKenzie, and D.L. Jones. 2024. Biochar effects on soil nutrient transformations. In J. Lehmann and S. Joseph (eds.) *Biochar for Environmental Management: Science and Technology, and Implementation*. Third Edition. Earthscan Publications Ltd, London.

3. Deluca, T.H., M.J. Gundale, M.D. MacKenzie, and D.L. Jones. 2015. Biochar effects on soil nutrient transformations. In J. Lehmann and S. Joseph (eds.) Biochar for Environmental Management: Science and Technology, and Implementation. Second Edition. Earthscan Publications Ltd, London.

2. Deluca, T.H., M.D. MacKenzie and M.J. Gundale. 2009. Biochar effects on soil nutrient transformations. In J. Lehmann and S. Joseph (eds.) Biochar for Environmental Management: Science, Technology, Earthscan Publications Ltd, London.

1. MacKenzie, M.D. 2007. Forest, range and wildland soils In Land Use, Land Cover and Soil Sciences, Encyclopedia of Life Support Systems, UNESCO Publications. Available on-line at: <http://portal.unesco.org>

Refereed Reports

1. Mackenzie, M.D., S. Hofstetter, I. Hatam and B. Lanoil, 2014. Carbon and Nitrogen Mineralization and Microbial Succession in Oil Sands Reclamation Soils Amended with Pyrogenic Carbon. Oil Sands Research and Information Network, University of Alberta, School of Energy and the Environment, Edmonton, Alberta. OSRIN Report No. TR-71. 29 pp.

Manuscripts in Review

1. Aguirre-Monroy, AM., JC. Santana-Martinez, MD. MacKenzie, and BD. Lanoil. Drivers of soil bacterial community composition in agricultural systems in Alberta and impact of farming practices on bacterial community attributes (submitted to Soil Biology and Biology)
2. Hernandez, JAC., MD. MacKenzie, and BD. Lanoil. Impact of stockpiling on soil fungal communities and their functions (Submitted to Restoration Ecology)
3. Hook, G., J.C. Santana Martinez, J.P. Battigelli, B.D. Lanoil, and MD. MacKenzie. Short-term response of soil mesofauna communities to anthropogenic disturbance in boreal forestsoils of northern Alberta. (Submitted to Applied Soil Ecology)
4. Das Gupta, S. and MD. MacKenzie. Spatial variability of soil nutrients in pyrogenic boreal aspen ecosystems: Aboveground and belowground controls (Submitted to PLOS One)
5. Martin, J. and MD. MacKenzie. Comparing wildfire to land reclamation in the Athabasca oil sands region: Plant and microbial communities (Submitted to Canadian Journal of Forest Research)

Research Grants and Proposals

1. Lobb, D., M.D. MacKenzie, et al. In Review. Advancing Soil and Crop Management Practices to Achieve Net-Zero Emissions from Agricultural Landscapes Across Canada. NSERC-SSHRC. \$8M (Proportion of funding 10%)

2. MacKenzie, M.D. and B. Lanoil. 2022. Determining specific compost blends for regenerative Agriculture in central Alberta. RDAR. \$125000 (Proportion of funding 50%)
3. Lanoil, B. M.D. MacKenzie et al. 2022. Functional Genomics for Soil Health in Alberta. RDAR/Genome Canada, CAP. \$750000 (Proportion of funding 33%)
4. MacKenzie, M.D. B. Lanoil and D. Wishart. 2022. Defining Soil Health in the Digital Age: Using machine learning to predict and assess the impact of agricultural practices on soil health across Alberta. Alberta Innovates, SAFDAC, \$500000 (Proportion of funding 50%)
5. MacKenzie, M.D and B. Lanoil. 2021. Alberta Soil Health: An Expansion of the Alberta Soil Quality Monitoring Project. RDAR. \$500000 (Proportion of funding 50%)
6. MacKenzie, M.D. 2020. NSERC Discovery. Pyrogenic carbon: A panacea for reclamation of below-ground ecosystem function? \$125 000 (Proportion of funding 100%)
7. MacKenzie, M.D., B. Lanoil, J. Battigelli, et al. 2019. Revisiting the soil quality benchmark sites to assess the effects of agronomic practices on soil biology as it relates physicochemical parameters and a quality index. Agriculture Funding Consortium. \$470 500 (Proportion of funding 50%)
8. Lanoil, B., and M.D. MacKenzie. 2018. Creating an index of biological integrity for the Athabasca Oil sands region. Canadian Natural Resources LTD. \$178 000 (Proportion of funding 50%)
9. MacKenzie, M.D. 2018. Monitoring the effect of oil sands surface mining on atmospheric deposition in Jack pine forests of northern Alberta: 20 year results. Wood Buffalo Environmental Association. \$58 000 (Proportion of funding 100%)
10. MacKenzie, M.D. 2018. Evaluating Topsoil requirements in OSE Pad Reclamation and the Use of Biochar as an Amendment. NSERC. \$ 25 000 (Proportion of funding 100%)
11. Lanoil, B., M.D. MacKenzie, et al. 2017. Salvaged soils and stockpiles: The good, the bad, and the ugly. CNRL Research Contract. \$438 000 (Proportion of funding 50%)
12. Okine, E., M.D. MacKenzie, et al. 2017. Examining the effect of biochar in the diet of cows for reducing greenhouse gas emissions. Agriculture and Agri-Food Canada, AGGP. \$696 247 (Proportion of funding 25%)
13. MacKenzie, M.D. 2017. Quantifying Pyrogenic Carbon in Forest Soils of Western Canada. NSERC GREF administered by the University of Alberta. \$24 000 (Proportion of funding 100%)

14. MacKenzie, M.D. 2014. Biochar is a Legacy Substrate that Modifies C and N Mineralization: Evaluating its Use in Land Reclamation. School of Energy and the Environment – Oil Sands Research and Information Network. \$22 500 (Proportion of funding 100%)
15. MacKenzie, M.D. 2012. Re-establishment of forest ecosystem plants, microbes, and soil processes at Syncrude Canada Ltd. Aurora North Mine operation. Syncrude Canada Ltd. \$762 099 (Proportion of funding 100%)
16. MacKenzie, M.D. 2011. NSERC Discovery. Examining black carbon in forested ecosystems of western Canada. \$125 000 (Proportion of funding 100%)
17. MacKenzie, M.D. 2011. Start-up funds for the Pyrogenic Ecosystem and Restoration Ecology Lab (PEREL). Canada Foundation for Innovation-Leaders Opportunity Fund. \$624 000 (Proportion of funding 100%)
18. Landhäusser, S., M. Dyck, M.D. MacKenzie, and E. Macdonald. 2010. The Efficacy of Subsoil Ripping to Improve Soil Conditions and Vegetation Establishment on Reclaimed Mine Sites: Establishing Resilient and Diverse Ecosystems in the Parkland Ecoregion. Helmholtz Alberta Initiative – Theme 6. \$2.4 M (Proportion of funding 20%)
19. Quideau, S.A., S. Landhäusser, M.D. MacKenzie, S. Grayston, R. Grant and C. Prescott. 2010. Carbon and Nitrogen Fluxes in Reconstructed Oil Sands Soils. NSERC CRD. \$696 247 (Proportion of funding 20%)
20. Landhäusser, S., M.D. MacKenzie, and S.A. Quideau. 2009. Selectively salvaged B/C horizons and phosphorus availability: Greenhouse Experiment. CONRAD ERRG. \$265 627 (Proportion of funding 25%)
21. Munson, A.D., S. Gauthier, D. Pare, S.A. Quideau, R.E. Wasylishen and M.D. MacKenzie. 2008. Fire severity and resilience: Impacts of climate change in boreal black spruce forests. NSERC Strategic proposal. \$479 800 (Proportion of funding 20%)
22. Quideau, S.A., S. Landhäusser, and M.D. MacKenzie. 2008. Nutrient Biogeochemistry Phase II Research Program in the Athabasca Oil Sands Region. CONRAD ERRG. \$2.2 M (Proportion of funding 10%)
23. MacKenzie, M.D., R.C. Graham, and S.A. Quideau. 2006. Charcoal in Sierra Nevada soils: Quantification and spatial variability. Kearney Foundation, University of California. \$ 40 000 (Proportion of funding 50%)
24. DeLuca, T.H. and M.D. MacKenzie. 2004. Nitrogen fixation in Ponderosa pinus forest of western Montana. McIntire-Stennis Grant, The University of Montana. \$47 704 (Proportion of funding 50%)

25. DeLuca, T.H., W.E. Holben, M.D. MacKenzie and P.N. Ball. 2003. Soil charcoal and nitrogen cycling in *Pinus ponderosa* ecosystems of western Montana. NSF-Ecosystems. \$450 000 (Proportion of funding 25%)

Invited Leadership Seminar

1. MacKenzie, M.D. 2024. The department of crop and soil science: A vision for the 21st century. Invited leadership seminar, Department of Crop and Soil Science, Oregon State University, Corvallis, OR.

Invited Research Seminars

1. MacKenzie, M.D. 2006. Les sols forestiers ont-ils une mémoire? (Do forest soils have a memory?) Invited research seminar, Forest Science Department, Laval University, Ste-Foy, QC.
2. MacKenzie, M.D. 2007. The role of disturbance in soil biogeochemistry and genesis. Invited research seminar, Department of Geosciences, University of Nevada, Las Vegas, NV.
3. MacKenzie, M.D. 2007. The role of disturbance in soil biogeochemistry and implications for management. Invited research seminar, Pacific Forestry Center, Canadian Forest Service, Victoria, BC.
4. MacKenzie, M.D. 2008. Environmental soil chemistry: linking disturbance with ecosystem function. Invited research seminar, Department of Renewable Resources, University of Alberta, Edmonton, AB.
5. MacKenzie, M.D. 2008. Forest Soils: Linking Disturbance with Ecosystem Function. Invited research seminar, Faculty of Forestry, University of Toronto, ON.
6. MacKenzie, M.D. 2016. Measuring Ecosystem Function in the Athabasca Oil Sands Region of Alberta: Problems and Solutions. Invited research seminar School of Environmental and Forest Sciences, University of Washington.
7. MacKenzie, M.D. 2022. Organic AB workshop. Invited to talk about Soil Health Research in Alberta and what the Soil-Plant Relations Lab is doing in this area. Included presentation and field tour.
8. MacKenzie, M.D. 2024. The Smart Agriculture, Food, and Environment Hub for Unified Bioresources (SAFE-HUB). Invited Seminar at Upper Bound, AI conference, Edmonton AB.

Conference Presentations

1. Khodaei, M., B. Lanouil, and M.D. MacKenzie. 2023. Can we use microbial community and function to indicate differences in soil health between conventional and regenerative

- agricultural practices? Poster presentation at the Canadian Society of Soil Science Annual Meeting, Truro, NS. 2023-06-27.
2. Khazaei, N., B. Lanoil, and MD. MacKenzie. 2023. Fungal communities are suitable soil health indicators in agricultural lands in Alberta. Poster presentation at the Canadian Society of Soil Science Annual Meeting, Truro, NS. 2023-06-27.
 3. Faramarzi, R., M. Gorzelak, B. Lanoil, and MD. MacKenzie. 2023. Are there indicator species of soil fungi for wet aggregate stability and do they vary by management and region? Oral presentation at the Canadian Society of Soil Science Annual Meeting, Truro, NS. 2023-06-27.
 4. Cardoso, C. and MD. MacKenzie, 2023. Using archived soil samples to examine carbon sequestration after 20 years of conservation tillage in Alberta, Canada. Poster presentation at the Alberta Soil Science Workshop, Calgary, AB. 2023-02-20.
 5. Faramarzi, R., M.D. MacKenzie, and M. Gorzelak. 2022. How soil microbial diversity can be explained under various environmental and land management conditions and how can it be an indicator in assessing soil health. Canadian Soil Science Society/Alberta Soil Science Workshop joint meeting, Edmonton, AB
 6. Weber, T. and M.D. MacKenzie. 2021. Biochar-Manure Amendment Influences Wheat (*Triticum aestivum*) Production in Northern Alberta, Canada. ASA, CSSA and SSSA International Annual Meetings, On-line
 7. Weber, T. and M.D. MacKenzie. 2021. Biochar-manure changes soil C mineralization in a Gray Luvisol used for agricultural production. CSSS annual Meetings, On-line
 8. Hook, G., J.P. Battigelli, B.D. Lanoil, and M.D. MacKenzie. 2020. Short-term response of soil mesofauna communities to anthropogenic disturbance of boreal forest soils of northern Alberta. ASA, CSSA and SSSA International Annual Meetings, On-line
 9. Weber, T. and M.D. MacKenzie. 2020. Significant differences in cumulative C mineralization rates when amending Gray Luvisol soil with manure from cattle fed biochar - ALES symposium, University of Alberta
 10. MacKenzie, M.D., S. Ali, and J. Kowalski. 2019. Biochar as a Reclamation Amendment for Oil Sands Exploration Pads in Boreal Alberta. ASA, CSSA and SSSA International Annual Meetings, San Antonio, TX, USA
 11. Lalonde, R., B.D. Pinno, N. Utting, and M.D. MacKenzie. 2018. Capping dewatered oil sands fine fluid tailings with salvaged reclamation soils at varying depths to grow woody plants. Soil Science Society of America, San Diego, CA, USA
 12. MacKenzie, M.D. 2018. Pyrogenic Carbon a Legacy Substrate for Forest Health and Restoration. Society of American Foresters National Convention, Portland, United States

13. MacKenzie, M.D., J. Hogberg, and B. Pinno. 2017. Can reclamation of above and belowground processes be measured with a functional similarity index?. North American Forest Ecology Workshop, Edmonton, AB, Canada
14. deBortoli, L., M.D. MacKenzie, et al. 2017. Plant and soil microbial community composition in response to seeding and weeding treatments on different reclamation soils. Ecological Society of America meeting. Portland, OR, Aug 14-17, 2017
15. Mathison, A., M.D. MacKenzie, et al. 2017. Ensuring plant diversity and restoring soil function in disturbed landscapes: Hitchhiking native forbs with white spruce. Ecological Society of America meeting. Portland, OR, Aug 14-17, 2017
16. MacKenzie, M.D., et al. 2017. Using a functional similarity index to assess reclamation strategies in the Athabasca oil sands region of northern Alberta, Canada. Ecological Society of America meeting. Portland, OR, Aug 14-17, 2017
17. Mausolf, M., M.D. MacKenzie, M. Flannigan. 2016. Charcoal Stimulates Ectomycorrhizal Fungal Association with Pine. ASA, CSSA and SSSA International Annual Meetings, Nov. 6-9, Phoenix, Arizona
18. Dietrich, S. and M.D. MacKenzie. 2016. Amendment of Biochar Improves Growth of Aspen on Oil Sands Reclamation Cover Soils Due to Changes in Nutrient Availability and SOM Stability. ASA, CSSA and SSSA International Annual Meetings, Nov. 6-9, Phoenix, Arizona
19. Hogberg, J., Brad Pinno. M Derek MacKenzie. 2016. Evaluating Foliar Nutrient Concentrations As an Indicator of Belowground Function in Reclaimed Soils of the Athabasca Oil Sands Region. ASA, CSSA and SSSA International Annual Meetings, Nov. 6-9, Phoenix, Arizona
20. Pinno, B., Mark Howell, Sanatan Das Gupta, M Derek MacKenzie. 2016. Similarity in Nutrient Profiles of Reclaimed and Natural Benchmark Soils in the Alberta Oil Sands. ASA, CSSA and SSSA International Annual Meetings, Nov. 6-9, Phoenix, Arizona
21. MacKenzie, MD., Jill Martin, Sylvie Quideau. 2016. Comparing Plant and Microbial Community Recovery Between Land Reclamation and Wildfire in the Athabasca Oil Sands Region. ASA, CSSA and SSSA International Annual Meetings, Nov. 6-9, Phoenix, Arizona
22. Dietrich, S.T. and M.D. Mackenzie. 2015. Spatial Pattern of Soil Respiration and Soil Microbial Biomass: Indicators for Reclamation Success. Oral presentation at the Soils Science Society of America conference, Minneapolis, MN.
23. Mackenzie, M.D., S. Hofstetter, Ido Hatam and Brian Lanoil. 2015. Pyrogenic Carbon Is a Legacy Substrate in Wildfire Ecosystems Such As the Boreal Plains: Should It be Used

in Land Reclamation? Oral presentation at the Soils Science Society of America conference, Minneapolis, MN

24. Dietrich, S.T., S. Das Gupta and M.D. MacKenzie. 2015. Spatial variability in nutrient availability and CO₂ efflux in oil sands reclaimed and benchmark upland boreal forest ecosystems. Poster presentation at the Alberta Soil Science Workshop, Edmonton AB.
25. Das Gupta, S. and M.D. Mackenzie. 2015. Spatial Patterns in Aboveground and Belowground Properties in Pyrogenic Boreal Aspen Ecosystems. Poster presentation at the Alberta Soil Science Workshop, Edmonton AB.
26. Howell, D.M. and M.D. MacKenzie. 2015. Assessment of coarse-textured topsoil application depths on microbial community structure and function in oil sands reclamation. Poster presentation at the Alberta Soil Science Workshop, Edmonton AB.
27. Taghavimehr, J. and M.D. MacKenzie. 2015. Short-Term Effect of Biochar on Soil Microbial Communities, Nutrient Availability, and Greenhouse Gases in Agroforestry Systems of Central Alberta. Oral presentation at the Alberta Soil Science Workshop, Edmonton AB.
28. Taghavimehr, J. and M.D. MacKenzie. 2014. Can Biochar Improve Soil Function in an Agroforestry System?: Effects of Nutrient Supply, Microbial Activity, and Greenhouse Gases. Oral presentation at the Soil Science Society of America annual meeting, Long Beach CA.
29. Howell D.M. and M.D. MacKenzie. 2014. Implications of topsoil placement depths for microbial communities in oil sands mine reclamation. Oral presentation at the Soil Science Society of America annual meeting, Long Beach CA.
30. Das Gupta, S., M.D. MacKenzie, and S. A. Quideau. 2014. Aboveground and belowground patterns in pyrogenic boreal ecosystems: what governs nutrient availability? Oral presentation at the Soil Science Society of America Annual Meeting, Long Beach, CA.
31. Filipow, N. and M.D. MacKenzie. 2014. Pyrogenic Carbon is a Legacy Substrate in Wildfire Ecosystems such as the Boreal Plains: Should it be used in Land Reclamation. Poster presentation at the Alberta Soil Science Workshop, Feb. 12-15, Calgary, AB.
32. Howell, D.M. and M.D. MacKenzie. 2014. Reclamation of Coarse Textured Soils Following Oil Sands Mining: Implications of Topsoil Placement Depth to Microbial Communities. Poster presentation at the Alberta Soil Science Workshop, Feb. 12-15, Calgary, AB.

33. Ikpo, N. and M.D. MacKenzie. 2014. Using DRIFT to Analyze Soil Biogeochemical Recovery after Natural and Anthropogenic Disturbance. Poster presentation at the Alberta Soil Science Workshop, Feb. 12-15, Calgary, AB.
34. Taghavimerh J. and M.D. MacKenzie. 2014. Can Biochar Improve Soil Function in an Agroforestry System: Effects of Nutrient Supply, Microbial Activity, and Greenhouse Gases. Poster presentation at the Alberta Soil Science Workshop, Feb. 12-15, Calgary, AB.
35. Das Gupta, S. and M.D. MacKenzie. 2014. Aboveground and Belowground Patterns in Pyrogenic Boreal Aspen Ecosystems: What Governs Nutrient Availability? Oral presentation at the Alberta Soil Science Workshop, Feb. 12-15, Calgary, AB.
36. MacKenzie M. D.. 2013. Is a charcoal a keystone substrate in Lodgepole pine ecosystems? Poster presentation at the 12th North American Forest Soils Conference, June 16-20, Whitefish, MT.
37. Amini S.A. and M.D. MacKenzie. 2013. Restoring native grassland function in the urban environment: Implications for soil-plant relations. Oral presentation at the Alberta Soil Science Workshop, Feb. 19-21, Lethbridge AB.
38. Das Gupta, S., M.D. MacKenzie, and S. A. Quideau. 2013. Spatial variations in soil respiration in a Boral aspen forest fire chronosequence. Poster presentation at the Alberta Soil Science Workshop, Feb. 19-21, Lethbridge AB.
39. Martin J. and M.D. MacKenzie. 2013. Wildfire nitrogen dynamics in the Alberta boreal forest soils: A comparison for anthropogenic disturbance. Oral presentation at the Alberta Soil Science Workshop, Feb. 19-21, Lethbridge AB.
40. MacKenzie, M.D. 2013. Nitrogen availability along a fire chronosequence in Lodgepole pine stands near Hinton, AB. Oral presentation at the Alberta Soil Science Workshop, Feb. 19-21, Lethbridge AB.
41. MacKenzie, M.D. 2013. Soil-Plant relations: A new capping study at Aurora mine. Poster presentation at the Alberta Soil Science Workshop, Feb. 19-21, Lethbridge AB.
42. Das Gupta S., M.D. MacKenzie, and S.A. Quideau. 2013. Spatial pattern of soil microbial properties and nutrient availability in a reclaimed aspen (*Populus tremuloides* Michx.) stand in north Alberta. Poster presentation at the North American Forest Soils Conference, June 16 - 21 Whitefish, MT
43. Sorenson, P.T., M. D. MacKenzie, S. M. Landhäusser, and S. A. Quideau. 2012. Ecological processes from spatial patterns of stand characteristics and soil nutrient availability in reclaimed boreal forests. Alberta Soil Science Workshop. Edmonton, Alberta, Feb. 14-16 (oral presentation).

44. Sorenson, P.T., M. D. MacKenzie, S. M. Landhäusser, and S. A. Quideau. 2012. Spatial patterns of stand characteristics and soil nutrient availability in reclaimed boreal forests. Ecological Society of America Annual Meetings, Portland, OR, USA, Aug 5-10 (oral presentation).
45. Das Gupta, S., M. D. MacKenzie, and S.A. Quideau. 2012. Spatial variability of soil biochemical properties in a 21 year old aspen stand on a oil sand reclaimed site in Northern Alberta. Alberta Soil Science Workshop. Edmonton, Alberta, Feb. 14-16 (oral presentation).
46. Soucémarianadin, L.N., R.E. Wasylishen, M.D. MacKenzie, and S.A. Quideau. 2012. Black carbon characterization in Quebec black spruce forests. European Geosciences Union General Assembly, Vienna, Austria. April 23-27 (poster).
47. Soucémarianadin, L.N., R.E. Wasylishen, M.D. MacKenzie, and S.A. Quideau. 2012. Where does all the pyrogenic organic matter go? Its fate in soils, water, and sediments. European Geosciences Union General Assembly, Vienna, Austria. April 23-27 (poster).
48. MacKenzie, M.D., S.A. Quideau, and S. Landhäusser. 2011. Spatial Variability in Canopy Cover, Forest Floor Mass, and Nutrient Availability in Reclaimed Oil Sands. Oral presentation at the North American Forest Ecology meeting, Roanoke, VA.
49. MacKenzie, M.D. 2010. Does Charcoal Affect the Spatial Pattern of Soil Processes in Forest Ecosystems? Paper presentation at the annual meeting of the Canadian Society of Soil Science, Saskatoon, SK.
50. Sorenson, P., S.A. Quideau, S. Landhäusser, and M.D. MacKenzie. 2009. Influence of Stand Type on Forest Floor Development in Reclaimed Oil Sands. Poster presentation, Soil science Society of America annual meeting, Pittsburgh, PA.
51. MacKenzie, M.D. and S.A. Quideau. 2009. Forest Floor Mineral Mix vs. Peat Mineral Mix: Reclamation Soil Type Matters. Oral presentation at the AB Soil Science Workshop, Edmonton, AB.
52. DeLuca, T.H., M.D. MacKenzie, M.J. Gundale, R. Brimmer. 2008. Charcoal and Nitrogen Cycling in Forest Ecosystems. Paper presentation at the annual meetings of the Soil Science Society of America, Houston, TX.
53. MacKenzie, M.D., S.A. Quideau and J.D. Leatherdale. 2007. Microbial communities and nutrient availability in reclaimed soils. Paper presentation at the annual meeting of the Soil Science Society of America, New Orleans, LA
54. Swallow, M.J.B., S.A. Quideau and MacKenzie, M.D. 2007. Prescribed burning: Effects on microbial communities within boreal forest floors. Poster presentation at a joint meeting between the Canadian Soil Science Society and the Association Québécoise de Spécialistes en Sciences du Sol, Station Touristique Duchesnay, Ste-Catherine-de-la-Jaques-Cartier, QC

55. MacKenzie, M.D., S.A. Quideau and J.D. Leatherdale. 2007. Nutrient availability and microbial community structure in reclaimed oils sand boreal forest soil. Poster presentation at a joint meeting between the Canadian Soil Science Society and the Association Québécoise de Spécialistes en Sciences du Sol, Station Touristique Duchesnay, Ste-Catherine-de-la-Jaques-Cartier, QC
56. MacKenzie, M.D., J.O. Skjemstad, R.C. Graham and S.A. Quideau. 2006. Charcoal Quantification in the Sierra Nevada, California: A Comparison of Analytical Techniques. Paper presentation at the annual meeting of the Soil Science Society of America, Indianapolis, IN.
57. P.N. Ball, M.D. Mackenzie, T.H. DeLuca and W.E. Holben. 2006. Fire frequency influences ammonium oxidizing bacteria and nitrogen cycling in ponderosa pine forests. Poster presentation at the 10th International Society for Microbial Ecology meeting in Vienna, Austria.
58. MacKenzie, M.D. 2006. Fire ecology: Linking forest soil fertility to disturbance and plant community. Invited research seminar, Department of Renewable Resources, University of Alberta, Edmonton, AB.
59. MacKenzie, M.D., R.C. Graham and S.A. Quideau. 2006. Charcoal in forest soils of the Sierra Nevada, California: Quantification and spatial variability. Paper presentation at the annual meeting of the Canadian Society of Soil Science, Banff, AB.
60. DeLuca, T.H., M.D. MacKenzie, A. Sala, P.N. Ball, W.E. Holben. 2005. Nitrification and fire intervals in ponderosa pine forests. Paper presentation at the annual meetings of the Soil Science Society of America, Salt Lake City, UT.
61. Mackenzie, M.D., P.N. Ball, J.L. Pollock, W.E. Holben and T.H. DeLuca. 2005. Charcoal from forest fire influences ammonium oxidizing bacteria and nitrogen cycling. Paper presentation at the joint meeting of the Ecological Society of America and the International Congress of Ecology in Montreal, QC.
62. Piña, C. P., M.D. MacKenzie and T.H. DeLuca. 2005. Charcoal stimulates nitrification in ponderosa pine forests of the dry inland northwest. Poster presentation at the Governors' convention, Helena, MT.
63. MacKenzie, M.D., T.H. DeLuca, M.J. Gundale. 2004. Charcoal and nitrification in pine ecosystems of the inland northwest. Paper presentation at the Soil Science Society of America's annual meeting in Seattle, WA.
64. MacKenzie, M.D. 2004. Fire exclusion, forest dynamics and nitrogen cycling in low elevation forests of western Montana. Invited research seminar, Department of Soil Science, University of Saskatchewan, Saskatoon, SK.

65. MacKenzie, M.D., T.H. DeLuca, M.J. Gundale, V.J. Kurth, and R.J. Brimmer. 2004. Biotic function of charcoal in pine ecosystems of the inland Northwest. Paper presentation at the Ecological Society of America's annual meeting in Portland, OR.
66. MacKenzie, M.D., T.H. DeLuca and A. Sala. 2003. Fire exclusion, community structure and N mineralization in low elevation forests of western Montana. Paper presentation at the Soil Science Society of America's annual meeting in Denver, CO.
67. MacKenzie, M.D., T.H. DeLuca and A. Sala. 2003. Fire exclusion, community structure and N mineralization in low elevation forests of western Montana. Paper presentation at the Canadian Society of Soil Science's annual meeting in Montreal, QC.
68. MacKenzie, M.D., T.H. DeLuca and A. Sala. 2002. Nitrogen dynamics along a fire chronosequence in the Ponderosa pine/Douglas-fir forests of western Montana. Paper presentation at the Soil Science Society of America's annual meeting in Indianapolis, IN.
69. MacKenzie, M.D., T.H. DeLuca and A. Sala. 2001. Influence of fire exclusion on stand structure and nitrogen cycling in Ponderosa pine/Douglas-fir forests of western Montana. Poster presentation at the Ecological Society of America's annual meeting in Madison , WI.
70. MacKenzie, M.D., M.G. Schmidt and L. Bedford. 1999. The Effect of Mechanical Site Preparation on Soil Properties at Two Northern British Columbia Plantations, Ten Years after Establishment. Paper presentation at the Western Division of the Canadian Association of Geographer's annual meeting in Kelowna, BC.
71. MacKenzie, M.D., M.G. Schmidt and L. Bedford. 1998. The Effect of Mechanical Site Preparation on Soil Properties, Nutrient Dynamics and Crop-tree Growth: Tenth year results. Poster presentation at the Ninth North American Forest Soils Conference in Lake Tahoe, CA.
72. MacKenzie, M.D., M.G. Schmidt and L. Bedford. 1998. The Effect of Mechanical Site Preparation on Soil Properties, Nutrient Dynamics and Crop-tree Growth: Tenth year results. Poster presentation at the Agricultural Institute of Canada Conference in Vancouver, BC.

Research Extension and Popular Media

1. MacKenzie, M.D. 2023. Soil Health workshop with the North Peace Applied Research Association, Manning
2. MacKenzie, M.D. 2023. Soil Health workshop at the Samson Cree Nation Community Hall in Maskwacis, Alberta, organized by the Alberta Beef Living Lab
3. MacKenzie, M.D. 2022. Greener Pastures Field tour. Invited to talk about Soil Health Research in Alberta and what the Soil-Plant Relations Lab is doing in this area. Included presentation and filed tour.

4. CBC Article. Just how healthy is Alberta's soil? A new database aims to find out. Posted: Jul 27, 2022 6:00 AM MDT | Last Updated: July 27, 2022
<https://www.cbc.ca/news/canada/edmonton/just-how-healthy-is-alberta-s-soil-a-new-database-aims-to-find-out-1.6529608>
5. Western Producer Article. Soil app would gather information in one database. Published: July 21, 2022 <https://www.producer.com/news/soil-app-would-gather-information-in-one-database/>
6. Alberta Farmer Express Article. GETTING THE DIRT ON DIRT: Big hopes for soil database app. Published: September 14, 2022
<https://www.albertafarmexpress.ca/crops/getting-the-dirt-on-dirt-big-hopes-for-soil-database-app>

Professional Service

Committee and Administrative Work

2023/5 to present	Chair of the Soil Health sub-committee in the CSSS, meets quarterly to discuss society initiatives
2022/9 to 2023/5	Organized a new Soil Health sub-committee in the CSSS, met 5 times with a working group, wrote the terms of reference
2024/5to present	Chair, Nominations Committee of the GFC, University of Alberta Meets quarterly to recommend candidates to fill executive positions on GFC
2023/5 to 2024/5	Vice-Chair, Nominations Committee of the GFC, University of Alberta Meets quarterly to recommend candidates to fill executive positions on GFC
2022/9 to 2023/5	Member, Nominations Committee of the GFC, University of Alberta Meets quarterly to recommend candidates to fill executive positions on GFC
2020/9 to present	Member, General Faculty Council, University of Alberta Meets monthly to make recommendations on Academic affairs to the Board of Governors
2019/9 to present	Member, Graduate Student Committee, University of Alberta Adjudicate departmental scholarships twice a year (QE II and internal faculty awards), and chair graduate exams (~5 per year)
2016/1 to 2022/9	Chair, Natural Resource Analytical Lab, University of Alberta

	Committee meets 4 times a year to oversee lab development, economics, and staff supervision
2019/9 to 2021/3	Councilor, Association of Academic Staff University of Alberta Council meets monthly to develop policies, by-laws, and bargaining priorities for the academic constituents
2012/1 to 2015/1	Member, Wildland Fire Sciences Program-Scientific Advisory Committee, University of Alberta
2014/1 - 2018/1	Committees meets once a year to decide on research directives Treasurer, Alberta Soils Science Workshop Directed finances for the annual meeting with a \$50 000 budget, including collecting conference fees, paying out student awards and travel fees, and conference center costs
2014/1 - 2015/12	Member, Natural Resource Analytical Lab Committee, University of Alberta Committee met 4 times per year to discuss the reorganization of the departmental lab, new equipment purchases and personnel/financial issue
2012/1 - 2014/12	Member, Alberta Soils Network, Alberta Institute of Agrologists Committee met 4 times per year to decide on the lunch and learn speakers and organized 4 talks per year to support continuing professional development of PAg's in Alberta
2011/1 - 2014/12	Member, Scientific Advisory Committee, Alberta Biochar Initiative Committee met 2 times per year to organize biochar symposium and to determine R&D priorities for biochar economic development
2010/1 - 2014/12	Member, Graduate Student Committee, University of Alberta Adjudicated departmental scholarships twice a year (QE II and internal faculty awards), and chaired graduate student exams (~5 per year)

Conference Session Organization

1. M.D. MacKenzie and B. Helgasson. 2023. Volunteer session on Soil Health at the Canadian Society for Soil Science Annual Meeting in Truro, NS.
2. M.D. MacKenzie and T. DeLuca. 2023. Symposium to honor the life and work of Jay Norton at the ASA, CSSA and SSSA International Annual Meetings in St. Louis, MO.
3. M.D. MacKenzie, B. Pinno and J. Norton. 2019. Volunteer session on Soils in Ecological Restoration at the ASA, CSSA and SSSA International Annual Meetings in San Antonio, TX.

4. M.D. MacKenzie, B. Pinno and J. Norton. 2018. Volunteer session on Soils in Ecological Restoration at the ASA, CSSA and SSSA International Annual Meetings in San Diego, CA.
5. M.D. MacKenzie and J. Norton. 2016. Volunteer session on Foundations of Ecological Restoration: Recovery of Soil Functions after Drastic Disturbance at the ASA, CSSA and SSSA International Annual Meetings in Phoenix, AZ.

Journal Review

Applied Environmental Soil Science	Ecosphere
Applied Geochemistry	Environments
Applied Soil Ecology	Environmental Review
Archives of Agronomy and Soil Science	Forests
Biochar	Forest Ecology Management
Biogeochemistry	Geoderma
Biology and Fertility of Soils	Global Change Biology
Canadian Journal of Forest Research	New Forest
Canadian Journal of Soil Science	Plant Ecology
Earth-Science Reviews	Plant and Soil
Ecohydrology	Restoration Ecology
Ecology and Evolution	Science of the Total Environment
Ecological Engineering	Soil Biology and Biochemistry
Ecological Research	Soil Science Society of America Journal

Grant Review

NSERC
Mitacs

Society Membership

2002 to present Ecological Society of America
2000 to present Soil Science Society of America
1996 to present Canadian Society of Soil Science

Highly Qualified Personnel

Student Supervision	Start	Finish	Co-Supervised	Research Topic
<i>BSc Students</i>				
Jocelyn Kowalski	2016	<i>in-prog</i>	No	Lab Coordinator
Zachery Fries	2021	2023	No	Soil Health – Lab and Field Tech
Molly Bannister	2019	2019	No	Restoration Ecology – Lab Tech
Haley Quadros	2019	2019	No	Restoration Ecology – Lab Tech
Peining Guan	2018	2018	No	LRIGS – Lab Tech
Monica Shandal	2017	2017	No	Reclamation – Lab Tech
Sylyanne Foo	2017	2017	No	Reclamation – Lab Tech
Patrick Neurenberg	2016	2016	No	Microbiology – Lab Tech

Nicole Filipow	2015	2015	No	Reclamation – Field/Lab Tech
Sawyer Desaulnier	2014	2014	No	Reclamation – Field/Lab Tech
Kaitlyn Scaber	2014	2014	No	Reclamation – Lab Tech
Maksat Igdyrov	2013	2013	No	Reclamation – Field/Lab Tech
Megan Lewis	2013	2013	No	Reclamation – Field/Lab Tech
Diana Debrowa	2012	2012	No	Reclamation – Lab Tech
Neil Stange	2009	2009	No	Reclamation – Field/Lab Tech
Aria Hahn	2009	2009	No	Reclamation – Lab Tech
Tyrel Hemsley	2009	2009	No	Reclamation – Field/Lab Tech
Clarice Piña	2005	2005	No	Forest Soils – Field/Lab Tech
David Grow	2004	2004	No	Forest Soils – Field/Lab Tech
<i>MSc Students</i>				
John De Leon		<i>in-prog</i>	No	Sustainable Agriculture and DRIFT
Zhino Karimi		<i>in-prog</i>	No	Quantifying Soil Health in Alberta
Mohammad Khodaei		<i>in-prog</i>	No	Sustainable Agriculture Biochar
Roya Faramarzi		<i>in-prog</i>	Yes	Genomics and Soil Quality
Shuqi Cui	2021	2023	No	Compost and Biochar Fertility
Angelic Aguirre	2019	2021	No	Genomics and Soil Quality
Michelle Mausolf	2017	2020	No	Wildfire and Mycorrhiza
Ryan Lalonde	2017	2019	Yes	Forest Ecosystem Reclamation
Jessica Hudson	2017	2019	Yes	Forest Ecosystem Reclamation
Adam Mathison	2016	2018	Yes	Forest Ecosystem Reclamation
Leah DeBartoli	2016	2018	Yes	Forest Ecosystem Reclamation
Jeff Hogberg	2015	2017	Yes	Forest Ecosystem Reclamation
Jill Martin	2012	2015	No	Fire and Reclamation
Mark Howell	2013	2015	No	Forest Ecosystem Reclamation
Jamal Taghavimehr	2013	2015	No	Agroforestry and Biochar
Jin Hu Liu	2010	2014	Yes	Reclamation and Biochar
Arezu Amini	2011	2013	No	Native Plants and Biochar
Tyrel Hemsley	2010	2012	Yes	N Dep and Reclamation
Preston Sorenson	2010	2012	Yes	Space and Reclamation
<i>PhD Students</i>				
Fatima Baks	2024	<i>in-prog</i>	No	Sustainable Ag Data Science
Camila Cardoso	2022	<i>in-prog</i>	No	Sustainable Ag Carbon Stability
Tien Weber	2018	2022	No	Sustainable Agriculture Biochar
Sebastian Dietrich	2014	2018	No	Forest Ecosystem Reclamation
Sanatan Das Gupta	2011	2015	Yes	Pyrogenic Ecosystems