

Curriculum Vitae

COLE D. GROSS

Website: coledgross.com

LinkedIn: [linkedin.com/in/coledgross](https://www.linkedin.com/in/coledgross)

RESEARCH INTERESTS

I am a soil scientist focusing on carbon cycling in forests, grasslands, and agroecosystems in response to human land-use and management decisions and climate change. I am passionate about advancing our understanding of soils to help manage our limited land resources sustainably and inform climate mitigation policies.

TEACHING PHILOSOPHY

As a teacher, I encourage critical thinking and collaboration while facilitating an inclusive and resilient classroom environment. My mentoring approach is to enhance understanding through effective guidance while emphasizing creative problem solving, collection and synthesis of quality data, idea generation, and science communication.

EDUCATION

PhD	University of Alberta, Renewable Resources (Soil Science)	2017/9 - 2022/8
MSc	University of Washington, Environmental and Forest Sciences	2015/6 - 2017/6
BA	University of West Florida, Philosophy/Religious Studies Concentration in Environmental Studies/Natural Science	2006/8 - 2010/8

PUBLICATIONS

*Peer-Reviewed (*as corresponding author)*

Gross CD, Bork EW, Carlyle CN, Chang SX (2022) Agroforestry perennials reduce nitrous oxide emissions and their live and dead trees increase ecosystem carbon storage. *Global Change Biology*, 28, 5956–5972. [doi:10.1111/gcb.16322](https://doi.org/10.1111/gcb.16322)

Gross CD, Bork EW, Carlyle CN, Chang SX (2022) Biochar and its manure-based feedstock have divergent effects on soil organic carbon and greenhouse gas emissions in croplands. *Science of The Total Environment*, 806, 151337. [doi:10.1016/j.scitotenv.2021.151337](https://doi.org/10.1016/j.scitotenv.2021.151337)

Ma Z, Bork EW, Carlyle CN, Tieu J, **Gross CD**, Chang SX (2022) Carbon stocks differ among land-uses in agroforestry systems in western Canada. *Agricultural and Forest Meteorology*, 313, 108756. [doi:10.1016/j.agrformet.2021.108756](https://doi.org/10.1016/j.agrformet.2021.108756)

An Z, Bork EW, Duan X, **Gross CD**, Carlyle CN, Chang SX (2022) Quantifying past, current, and future forest carbon stocks within agroforestry systems in central Alberta, Canada. *GCB Bioenergy*, 14, 669–680. [doi:10.1111/gcbb.12934](https://doi.org/10.1111/gcbb.12934)

Weber TL, Hao X, **Gross CD**, Beauchemin KA, Chang SX (2022) The effect of manure from cattle fed barley- vs corn-based diets on greenhouse gas emissions depends on soil type. *Soil Systems*, 6, 47. [doi:10.3390/soilsystems6020047](https://doi.org/10.3390/soilsystems6020047)

Battaglia ML, Thomason WE, Fike JH, Evanylo GK, Stewart RD, **Gross CD**, Seleiman M, Babur E, Sadehpour A, Harrison MT (2022) Corn and wheat residue management effects on greenhouse gas emissions in the Mid-Atlantic USA. *Land*, 11, 846. [doi:10.3390/land11060846](https://doi.org/10.3390/land11060846)

Lemelin C, **Gross CD**, Bertholet R, Gares S, Hall M, Henein H, Kozlova V, Spila M, Villatoro V, Haave N (2021) Mitigating student resistance to active learning by constructing resilient classrooms. *Bioscene*, 47(2), 3–9. [ISSN 1539-2422](https://doi.org/10.1539-2422)

Weber TL, Hao X, **Gross CD**, Beauchemin KA, Chang SX (2021) Effect of manure from cattle fed 3-nitrooxypropanol on anthropogenic greenhouse gas emissions depends on soil type. *Agronomy*, 11, 371. [doi:10.3390/agronomy11020371](https://doi.org/10.3390/agronomy11020371)

***Gross CD**, Harrison RB (2019) The case for digging deeper: Soil organic carbon storage, dynamics, and controls in our changing world. *Soil Systems*, 3, 28. [doi:10.3390/soilsystems3020028](https://doi.org/10.3390/soilsystems3020028)

James JN, **Gross CD**, Dwivedi P, Myers T, Santos F, Bernardi R, Fidalgo M, Faria D, Amaral I, Harrison R, Butman D (2019) Land use change alters the radiocarbon age and composition of soil and water-soluble organic matter in the Brazilian Cerrado. *Geoderma*, 345, 38–50. [doi:10.1016/j.geoderma.2019.03.019](https://doi.org/10.1016/j.geoderma.2019.03.019)

***Gross CD**, James JN, Turnblom EC, Harrison RB (2018) Thinning treatments reduce deep soil carbon and nitrogen stocks in a coastal Pacific Northwest forest. *Forests*, 9, 1–19. [doi:10.3390/f9050238](https://doi.org/10.3390/f9050238)

***Gross CD**, Harrison RB (2018) Quantifying and comparing soil carbon stocks: Underestimation with the core sampling method. *Soil Science Society of America Journal*, 82, 949. [doi:10.2136/sssaj2018.01.0015](https://doi.org/10.2136/sssaj2018.01.0015)

Accepted

Lemelin C, **Gross CD**, Bertholet R, Gares S, Hall M, Henein H, Kozlova V, Spila M, Villatoro V, Haave N (May 2023) Dismantling disciplinary silos: A Faculty Learning Community facilitates interdisciplinary teaching development. *Journal of Faculty Development*.

Other

Gross CD (2019) Strengthen your teaching skills to enhance student learning. *CSA News Magazine*, 64, 2, 26–28. [doi:10.2134/csa2019.64.0222](https://doi.org/10.2134/csa2019.64.0222)

Gross CD (2019) Annotated bibliography: Active learning, student resilience. University of Alberta Centre for Teaching and Learning. [doi:10.7939/r3-72j8-p869](https://doi.org/10.7939/r3-72j8-p869)

Gross CD (2018) Your science story: Part II, Writing outside the box. *CSA News Magazine*, 63, 11, 40–41. [doi:10.2134/csa2018.63.1128](https://doi.org/10.2134/csa2018.63.1128)

Gross CD, Battaglia M (2018) Your science story: Part I, Avoiding an impenetrable fog. *CSA News Magazine*, 63, 10, 34–35. [doi:10.2134/csa2018.63.1026](https://doi.org/10.2134/csa2018.63.1026)

GRANTS, AWARDS, AND HONORS (*SELECTED*)

Izaak Walton Killam Memorial Scholarship University of Alberta, Faculty of Graduate Studies and Research (\$45,000 CAD per annum - honorary while holding Vanier; \$3,800–4,400 CAD per annum differential fees award)	2020/9 - 2022/8
C.F. Bentley & ASSW Awards for Student Oral Presentation Canadian Society of Soil Science (winner - \$500 CAD) Alberta Soil Science Workshop (winner - \$500 CAD)	2022/5
Doctoral Vanier Canada Graduate Scholarship Government of Canada & Natural Sciences and Engineering Research Council (NSERC) of Canada (\$50,000 CAD per annum)	2019/5 - 2022/4
President's Doctoral Prize of Distinction University of Alberta (\$5,800–10,000 CAD per annum)	2019/5 - 2022/4
Graduate Student Teaching Award University of Alberta, Graduate Students' Association (\$500 CAD)	2022/4
Graduate Student Teaching Award University of Alberta, Faculty of Graduate Studies and Research	2020/4
Graduate Student Teaching Award University of Alberta, Graduate Students' Association (\$500 CAD)	2020/4
Syngenta Graduate Scholarship in Sustainable Agriculture University of Alberta (\$7,600 CAD)	2018/9 - 2019/8
Graduate Student Teaching Award University of Alberta, Faculty of Graduate Studies and Research	2019/4

University of Alberta Doctoral Recruitment Scholarship
University of Alberta (\$10,000 CAD)

2017/9 - 2018/8

RELEVANT WORK EXPERIENCE

Postdoctoral Associate, Yale University

2022/9 - present

Supervisors: Sara Kuebbing & Mark Bradford

- Lead two independent projects, including 1) synthesizing available research on the impacts of agroforestry and silvopasture on carbon storage and sequestration and 2) sourcing available data and designing a model structure for estimating carbon storage and sequestration for cranberry farm agroecosystems

Forest Soils Laboratory Manager, University of Alberta

2018/6 - 2022/8

Supervisor: Scott X. Chang

- Managed an active laboratory, including training personnel and operating state-of-the-art analytical equipment

Graduate Research Assistant, University of Alberta

2021/2 - 2021/3

Supervisor: Scott X. Chang

- Classified, cataloged, and photographed 100+ soil monoliths for the University of Alberta Museums' database

Graduate Research Assistant, University of Alberta

2020/6 - 2020/8

Supervisor: Neil Haave

- Wrote a scholarly review on Faculty Learning Communities facilitating interdisciplinary teaching development

Graduate Research Assistant, University of Alberta

2019/2 - 2019/5

Supervisor: Neil Haave

- Performed a literature review and created an annotated bibliography on student resistance to active learning

Research Assistant, University of Alberta

2017/7 - 2017/8

Supervisor: Scott X. Chang

- Co-designed and set up an extensive agroforestry experiment at ten sites in central Alberta, Canada

Soils Intern, Washington State Department of Natural Resources

2016/6 - 2016/9

Supervisor: Nicole Jacobsen

- Co-developed the concept and completed portions of a project integrating relevant soils information to inform both land management policy and resource protection goals

TEACHING EXPERIENCE

Part-Time Positions

Graduate Teaching Assistant, Laboratory Instructor 2018/1 - 2022/4
Forest Soils (RENR 314/749), Winter Semester
University of Alberta, Department of Renewable Resources

- Independently instructed laboratory portion of course, including developing curriculum materials such as all presentations, handouts, assignments, and assessments

Graduate Teaching Assistant 2021/9 - 2021/12
Geographical Information Systems Applications in Renewable Resources (RENR 426/526), Fall Semester
University of Alberta, Department of Renewable Resources

- Assisted students with group projects and graded

Graduate Teaching Assistant, Laboratory Instructor 2021/9 - 2021/12
Introduction to Soil Science (RENR 210), Fall Semester
University of Alberta, Department of Renewable Resources

- Instructed laboratory portion of course

Graduate Teaching Assistant, Laboratory Instructor 2018/9 - 2020/12
Introduction to Geomatic Techniques in Natural Resource Management (RENR 201), Fall Semester
University of Alberta, Department of Renewable Resources

- Instructed laboratory portion of course

Academic Tutor 2017/1 - 2017/6
Introduction to Environmental Science (ESRM 100), all quarters
University of Washington, Ctr. for Learning and Undergrad. Enrich.

- Led group and individual tutoring sessions

Graduate Teaching Assistant, Lead Teaching Assistant 2015/6 - 2017/6
Introduction to Environmental Science (ESRM 100), all quarters
University of Washington, School of Envir. & Forest Sciences

- Lead teaching assistant for six consecutive quarters in charge of the website content, exams, grading, and coordinating a team of six to ten teaching assistants

Guest Lectures

Guest Lecturer, Introduction to Soil Science (RENR 210) 2022/11
University of Alberta, Department of Renewable Resources
Invited by Dr. M. Derek MacKenzie

Guest Lecturer , Environmental Soil Science University of Alberta, Department of Renewable Resources Zhejiang Normal University, ESL Program Invited by Dr. Nadir Erbilgin & Erin Daly	2022/9
Guest Lecturer , Forest Soils (RENR 314/749) University of Alberta, Department of Renewable Resources Invited by Dr. Scott X. Chang	2022/3
Guest Lecturer , Introduction to Soil Science (RENR 210) University of Alberta, Department of Renewable Resources Invited by Dr. M. Derek MacKenzie	2021/11
Guest Lecturer , Environmental Soil Science University of Alberta, Department of Renewable Resources Zhejiang Normal University, ESL Program Invited by Dr. Nadir Erbilgin & Erin Daly	2021/10 - 2021/11
Guest Lecturer , Forest Soils (RENR 314/749) University of Alberta, Department of Renewable Resources Invited by Dr. Scott X. Chang	2019/1
Guest Lecturer , Adv. Forest Soil Fert. and Chem. (ESRM 414/514) University of Washington, School of Envir. & Forest Sciences Invited by Dr. Robert B. Harrison	2017/4
Guest Lecturer , Introduction to Soil Science (ENVS 204) Seattle Central College, Environmental Science Program Invited by Dr. Grace Sparks	2017/2
Guest Lecturer , Envir. Sci. and Resource Mgmt. Seminar (ESRM 429) University of Washington, School of Envir. & Forest Sciences Invited by Dr. Thomas H. DeLuca & Si Gao	2017/2
Guest Lecturer , Natural Science and the Environment (ENVS 204) Green River Community College, Environmental Science Program Invited by Gene McCaul	2017/1

MENTORING EXPERIENCE

Research Supervisor , University of Alberta Program: Mitacs Student: Salvador Meza	2021/8 - 2021/10
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Research Supervisor , University of Alberta Assistants: Guanyu Chen, Sheetal Patel, Maliha Rahman, Mary Villeneuve, Qi Wang	2018/3 - 2021/2
Research Supervisor , University of Alberta Program: Women in Scholarship, Engr., Sci., and Technology Students: Hailey Anderson, Emma Bowman, Danielle Ratcliffe, Wendi Yu	2018/7 - 2020/8
Research Supervisor , University of Alberta Program: University of Alberta International Students: Max Menear, Runli Yuan	2018/7 - 2019/10
Research Supervisor , University of Alberta Program: Undergraduate Research Initiative Students: Ming Cao, Dhaniket Patel	2019/4 - 2019/9
Research Supervisor , University of Alberta Program: Natural Sci. and Engr. Research Council of Canada Student: Jonathan Tieu	2018/5 - 2018/8
Research Supervisor , University of Washington Program: Undergraduate Research (ESRM 499) Students: Hanzhang Ding, Tony Scigliano	2016/4 - 2016/6

SCIENTIFIC SERVICE AND PROFESSIONAL AFFILIATIONS

Peer-Reviewer for:

Global Change Biology (1); Biology and Fertility of Soils (6); Science of the Total Environment (3); Applied Soil Ecology (3); European Journal of Soil Science (2); Ecological Applications (1); Global Change Biology Bioenergy (1); Forests (8); Mitigation and Adaptation Strategies for Global Change (1)

Guest Editor

Special Issue of *Land*, MDPI Open Access Journal

2022/9 - present

Northwest Forest Soils Council Member

BMP document editor and carbon chapter lead author

2017 - present

2022/3 - present

Agronomy, Crop, and Soil Science Societies of America Member

SSSA K-12 Committee Member

SSSA K-12 Soil Basics Poster Subcommittee Member

Graduate Student Committee Member

Board of Director Representative Subcommittee Member

Communicating Science Subcommittee Member

Leadership Conference Subcommittee Member

2015 - present

2018/1 - 2021/12

2019/1 - 2020/1

2017/1 - 2019/12

2017/5 - 2019/12

2019/2 - 2019/11

2017/1 - 2019/1

Canadian Society of Soil Science Member	2021 - present
CSSS-ASSW 2022 Soil Carbon Cycling Session Convener	2021/11 - 2022/5
Equity, Diversity, and Inclusivity Committee Member	2021/9 - 2022/8
University of Alberta, Department of Renewable Resources	
Environmental Soil Science Course Co-Developer	2021/9 - 2021/11
University of Alberta & Zhejiang Normal University	
Green and Gold Grant Adjudicator	2019/6 - 2021/6
University of Alberta, Career Centre	
Society of American Foresters Member (UW Chapter)	2015 - 2017
Chair (former Vice Chair); Website Developer and Manager	2015/10 - 2017/9
Society for Ecological Restoration Member (UW Chapter)	2015 - 2017
Restoration Area Manager; Website Developer and Manager	2015/6 - 2016/8
Graduate Student Symposium Organizer	2017/1 - 2017/3
University of Washington, School of Envir. & Forest Sciences	

PROFESSIONAL TRAINING

Bayesian Statistics Workshop	2023/1 - 2023/2
University of Alberta	
Yale GIS Accelerator Program	2022/12
Yale University	
Graduate Teaching and Learning Program	2018/1 - 2019/7
University of Alberta	
Supervisory EHS Professional Development Training	2019/4
University of Alberta, Environment, Health and Safety	
Research Zone Science Communication Fellowship	2019/3
Telus World of Science, Edmonton, Alberta	
Professional Development Program	2017/7 - 2018/3
University of Alberta	
Graduate Student Leadership Workshop	2016/11
Crops, Soils, and Agronomy Societies of America	

PRESENTATIONS AND SPEAKING ENGAGEMENTS (*SELECTED*)

Oral Presentation (2022/11) “Agroforestry perennials reduce nitrous oxide emissions and their live and dead trees increase ecosystem carbon storage,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. Gross CD, Bork EW, Carlyle CN, Chang SX.

Oral Presentation (2022/11) “Root-driven destabilization of clay-protected carbon within silt-size microaggregates,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. Gross CD, Bork EW, Wissel B, Carlyle CN, Chang SX.

Poster Presentation (2022/8) “Soil carbon stocks and emissions across two common agroforestry systems are affected by deadwood,” 22nd World Congress of Soil Science. Gross CD, Bork EW, Carlyle CN, Chang SX. **received full scholarship*

Poster Presentation (2022/8) “Root-driven clay aggregate disruption is a key mechanism of rhizosphere priming across land uses and soil depths,” 22nd World Congress of Soil Science. Gross CD, Bork EW, Wissel B, Carlyle CN, Chang SX. **received full scholarship*

Poster Presentation (2022/7) “Agroforestry perennials reduce nitrous oxide emissions and their live and dead trees increase ecosystem carbon storage,” World Congress on Agroforestry. Gross CD, Bork EW, Carlyle CN, Chang SX. **received full scholarship*

Oral Presentation (2022/5) “Agroforestry perennials reduce nitrous oxide emissions and their live and dead trees increase ecosystem carbon storage,” Canadian Society of Soil Science Annual Meeting and Alberta Soil Science Workshop. Gross CD, Bork EW, Carlyle CN, Chang SX.

Poster Presentation (2022/5) “Clay aggregates as the nucleus of root-driven soil organic carbon priming,” Canadian Society of Soil Science Annual Meeting and Alberta Soil Science Workshop. Gross CD, Bork EW, Wissel B, Carlyle CN, Chang SX.

Oral Presentation (2022/3) “Biochar and its manure-based feedstock have divergent effects on soil organic carbon and greenhouse gas emissions in croplands,” Soils and Crops Conference and Workshop. Gross CD, Bork EW, Carlyle CN, Chang SX. **received full scholarship*

Oral Presentation (2021/11) “Biochar and its manure-based feedstock have divergent effects on soil organic carbon and greenhouse gas emissions in croplands,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. Gross CD, Bork EW, Carlyle CN, Chang SX.

Poster Presentation (2021/11) “Root-driven clay aggregate disruption is a key mechanism of rhizosphere priming across land uses and soil depths,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. Gross CD, Bork EW, Wissel B, Carlyle CN, Chang SX.

Oral Presentation (2021/6) “Enhancing soil organic carbon storage through forested buffers and biochar application in agricultural lands,” North American Agroforestry Conference. Gross CD, Bork EW, Carlyle CN, Chang SX. **received full scholarship*

Oral Presentation (2021/6) “Enhancing soil organic carbon storage through forested buffers and biochar application in agricultural lands,” Canadian Society of Soil Science Annual Meeting. Gross CD, Bork EW, Carlyle CN, Chang SX.

Oral Presentation (2021/3) “Enhancing soil organic carbon storage through forested buffers and biochar application in agricultural lands,” Soils and Crops Conference and Workshop. Gross CD, Bork EW, Carlyle CN, Chang SX. **received full scholarship*

Invited Panelist (2021/1) “Teaching in the Canadian Classroom,” University of Alberta, Faculty of Graduate Studies and Research.

Invited Speaker (2019/9) “Agroforestry Webinar,” Rural Routes to Climate Solutions, Alberta, Canada.

Invited Panelist (2018/8) “PhD Onboarding Seminar: Getting off on the Right Foot,” University of Alberta, Faculty of Graduate Studies and Research.

Invited Speaker (2018/6) “Bridging the gap between creativity and structure,” University of Alberta, Faculty of Graduate Studies and Research.

Oral Presentation (2017/10) “Soil carbon response to thinning and fertilization treatments in a coastal Pacific Northwest forest,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. Gross CD, James JN, Turnblom EC, Harrison RB. **received travel scholarship*

Oral Presentation (2017/10) “Coupling solid- and liquid-phase soil organic matter analyses to understand the consequences of forest conversion and management on Brazilian Oxisols,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. James JN, Gross CD, Dwivedi P, Myers T, Santos F, Bernardi R, Fidalgo M, Faria D, Amaral I, Harrison R, Butman D. **received travel scholarship*

Oral Presentation (2016/11) “Effects of nitrogen fertilization and thinning treatments on subsurface soil carbon and nitrogen,” Agronomy, Crop, and Soil Science Societies of America International Annual Meeting. Gross CD, James JN, Turnblom EC, Harrison RB. **received travel scholarships*

Invited Presentation (2016/4) “Forest management impacts on soil carbon: Case studies from wet coastal to dry interior Pacific Northwest forests,” Society for Ecological Restoration Regional Conference. Gross CD, Footen PW, James JN, Himes AJ, Harrison RB.

COMMUNITY AND VOLUNTEER WORK

Research Supervisor and Mentor University of Alberta, Women in Scholarship, Engineering, Science and Technology	2018/7 - 2022/8
Soil Science Presenter University of Alberta, U School	2017/11 - 2022/8
Scientist Mentor Bryant Elementary School, Seattle, Washington	2016/11 - 2017/3
Natural Resources Career Fair Organizer University of Washington, School of Env. and Forest Sciences	2016/10 - 2017/2
Science Interpreter Pacific Science Center, Seattle, Washington	2015/6 - 2015/9

LABORATORY AND TECHNICAL SKILLS

Laboratory: elemental analyzer; total organic carbon and nitrogen analyzer; gas chromatograph; fluorometer; UV-Vis spectrophotometer; ultrasonic processor; centrifuge; soil fractionation, fumigation, and geochemical techniques; common soil analyses; hazard assessment and developing and ensuring safe operating procedures

Field: soil classification (USDA and CDN) and sampling (cores, augers, probes, clods, volumetric); soil-atmosphere exchange of greenhouse gases using static chambers and an infrared gas analyzer (LI-COR); soil temperature and moisture using dataloggers; site assessment; hazard assessment and developing and ensuring safe operating procedures

Software: RStudio; ArcGIS Pro; ArcGIS StoryMaps; Rayyan; SoilFluxPro; Mendeley; Microsoft Office Suite; Adobe Acrobat Pro DC and Illustrator

Other: complex dataset management, analysis, and synthesis; project management; interdisciplinary collaboration; lab management; technical writing; grant and scholarship writing; science communication; leadership; team building; creative problem solving; communication; adaptability; teaching; editing; organization; optimization; personnel management; time management; public speaking; art and graphic design; creative writing