

## CLAUDIA MICHAELA BOOT

Materials and Molecular Analysis Center, Analytical Resources Core

Colorado State University, Fort Collins, CO 80523-1872

office: 970-491-7049 mobile: 970-829-2366

e-mail: [claudia.boot@colostate.edu](mailto:claudia.boot@colostate.edu)

web: [www.ecosystemchemistrylab.com](http://www.ecosystemchemistrylab.com) & <http://orcid.org/0000-0002-1487-242X>

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### EDUCATION

- 2001 – 2007 Ph.D. Department of Ocean Sciences  
Advisor: Prof. Phillip Crews (Dept. of Chemistry and Biochemistry)  
University of California, Santa Cruz, CA
- 1997 – 1999 B.A. Ecology and Evolutionary Biology  
University of Colorado, Boulder, CO
- 1995 – 1997 Undergraduate studies in Biology  
University of Puget Sound, Tacoma, WA
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### PROFESSIONAL APPOINTMENTS

- 2022 – present Research Scientist III, Analytical Resources Core, CSU, Fort Collins, CO
- 2022 – present Associate Research Professor, Department of Chemistry, CSU, Fort Collins, CO
- 2015 – present Affiliate Faculty, Graduate Degree Program in Ecology, CSU, Fort Collins, CO
- 2015 – present Instructor, Department of Ecosystem Science and Sustainability, CSU, Fort Collins, CO
- 2020 – 2021 Assistant Research Professor, Department of Chemistry, CSU, Fort Collins, CO
- 2016 – 2021 Research Scientist II, Analytical Resources Core, CSU, Fort Collins, CO
- 2015 – 2016 Research Associate III, Department of Chemistry, CSU, Fort Collins, CO
- 2012 – 2015 Research Scientist I, Natural Resource Ecology Laboratory, Fort Collins, CO
- 2012 – 2014 Affiliate Scientist, University of Wyoming, Laramie, WY
- 2009 – 2012 Postdoctoral Fellow, NSF Office of Polar Programs, Colorado State University, Fort Collins, CO, and University of California, Santa Barbara, CA
- 2007 – 2009 Postdoctoral Scholar, University of California Santa Barbara, CA
- 2004 – 2007 PhD Candidate, University of California Santa Cruz, CA
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### FELLOWSHIPS and AWARDS

- 2022 Co-PI, Grantham Foundation: Soil Moonshots Phase III (\$2M)
- 2021 Co-PI, NSF Major Research Instrumentation: Acquisition of an Open Access Shared-Use MALDI-TOF/TOF Mass Spectrometer (\$400K)
- 2021 Co-PI, Grantham Foundation: Soil Moonshots Phase I (\$650K)
- 2021 Co-PI, CSU OVPF Research Continuation Fund: Developing Digital Hands-on Training Tools in the ARC (\$25K)
- 2020 Co-PI, WM Keck Foundation: Through the looking glass: Challenging a Fundamental Paradigm of Carbohydrate Metabolism (\$1M)
- 2020 Co-PI, Grantham Foundation: Soil Moonshots, A CSU-Grantham partnership (\$100K)
- 2019 Co-PI, USDA AFRI Exploratory Research: Exploring a blue ocean strategy for terrestrial C sequestration (\$197K)
- 2018 Co-PI, DOE BER Subsurface Biogeochemical Research: Quantifying hydro-biogeochemical controls on watershed dissolved organic matter flux and processing (\$200K)
- 2017 Co-PI, WCNR McIntire Stennis: Determining the role of forest cover and hillslope hydrologic connectivity in controlling the export of water and dissolved organic matter (\$22K)
- 2016 Certificate of Excellence in Reviewing, *Biogeochemistry*

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2014	Co-PI, NSF Catalyzing New International Collaborations: US-Switzerland-Australia Site Visits: Expanding and Advancing Black Carbon Research Through New International Collaborations (\$54K)
2013	Co-PI, CSU Water Center: Developing scholarly excellence across the aquatic-terrestrial interface: Understanding the hydro-bio-geo-chemistry of extreme events (\$25K)
2009	Postdoctoral Fellowship, Office of Polar Programs, National Science Foundation (\$239K)
2011	Warner College of Natural Resources Research Grant, Colorado State University (\$10K)
2007	Dr. Earl and Ethyl Myers Oceanographic Trust Grant, University of California (\$1.5K)
2006	Graduate Association Travel Grant, University of California (\$800)
2006	Journal of Natural Products – Top Ten Most Cited Articles
2002 – 2005	Graduate Assistance in Areas of National Need (GAANN) Fellowship, University of California
2001	Ocean Sciences Department Fellowship, University of California
1998 – 1999	Chancellor's Diversity Scholarship, University of Colorado
1995 – 1996	President's Scholarship, University of Puget Sound

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#### PEER REVIEWED PUBLICATIONS

1. Carbone MS, AD Richardson, B Barr, M Berkelgammer, **CM Boot**, A Simonpietri, CJ Still. 2023. Interannual moisture controls on soil CO<sub>2</sub> fluxes in high elevation coniferous and aspen forests. *Environmental Research Letters* 18: 124009. <https://doi.org/10.1088/1748-9326/ad07b5>
2. Boot, CM, CD Broeckling MD Wallenstein, JP Schimel. 2022. Ecosystem metabolomics of dissolved organic matter from arctic soil pore water across seasonal transitions. *Applied Environmental Metabolomics* p. 91-106. <https://doi.org/10.1016/B978-0-12-816460-0.00008-3>
3. Figueiredo M, H Barns, **C Boot**, AB Figueiredo, S Nissen, F Dayan, T Gains. 2022. Identification of a novel 2,4-D metabolic detoxification pathway in 2,4-D resistant waterhemp (*Amaranthus tuberculatus*). *Journal of Agricultural and Food Chemistry* 70(49): 15380-15389. <http://doi:10.1021/acs.jafc.2c05908>
4. Pressler Y, **CM Boot**, S Abiven, E Lugaot, F Cotrufo. 2022. Continental-scale measurements of soil pyrogenic carbon in Europe contrast with estimated production rates. *Soil Research* 60(2): 103-113. <http://doi:10.1071/SR19396>
5. Fegel T, **CM Boot**, T Covino, K Elder, EK Hall, B Starr, J Stegen, CC Rhoades. 2021. Amount and reactivity of DOM export are affected by land cover change from old-growth to second-growth forests in headwater ecosystems. *Hydrological Processes* 35(8):e14343. <http://dx.doi.org/10.1002/hyp.14343>
6. Walker TB, JM Edwards, MJ Baretta, **CM Boot**, K Deneff, M Burnett, T Bauder, ZD Weller. 2021. Comparing the removal of pesticide residue from clothing with different washing and drying methods. *Journal of Pesticide Safety Education* 23:9-43.
7. Townsend JR, WC Vantrease, MD Jones, PA Sapp, K Johnson, CN Beuning, AA Haase, **CM Boot**. 2021. Plasma amino acid response to whey protein ingestion following 28-days of probiotic (*Bacillus subtilis* DE111) supplementation in active men and women. *Journal of Functional Morphology and Kinesiology* 6:1. <https://dx.doi.org/10.3390/jfmk6010001>.
8. Angala SK, W Li, **CM Boot**, M Jackson MR McNeil. 2020. Secondary extended mannan side chains and attachment of the arbinan in Mycobacterial Lipoarabinomannan. *Communications Chemistry* 3:101; [Read it here.](#)

9. Townsend JR, JE Morimune, MD Jones, CN Beuning, AA Haase, **CM Boot**, SH Heffington, LA Littlefield, RH Henry, AM Marshall, TA VanDusseldorp, Y Feito, GT Mangine. 2020. The Effect of ProHydrolase® on the Amino Acid and Intramuscular Anabolic Signaling Response to Resistance Exercise in Trained Males. *Sports* 8(1):13.
10. De, P, S Libin, **CM Boot**, D Ordway, M McNeil, D Chatterjee. 2019. Comparative structural study of terminal ends of liparabinomannan from mice infected lung tissues and urine of TB positive patient. *ACS Infectious Diseases*. DOI: 10.1021/acsinfecdis.9b00355.
11. Fegal, T, **CM Boot**, CD Broeckling, J Baron, EK Hall. 2019. Linking the chemistry and reactivity of dissolved organic matter from glaciers and rock glaciers. *Journal of Geophysical Research* 124:1988-2004. DOI: 10.1029/2018JG004874.
12. Muscarella, ME, **CM Boot**, CD Broeckling, JT Lennon. 2019. Resource diversity structures aquatic bacterial communities. *ISME J* 13:2183-2195. DOI: 10.1038/s41396-019-0427-7
13. Lynch, LM, MB Machmuller, **CM Boot**, TP Covino, CD Rithner, MF Cotrufo, DW Hoyt, MD Wallenstein. 2019. Dissolved organic matter chemistry and transport along an Arctic tundra hillslope. *Global Biogeochemical Cycles* 33(1). DOI: 10.1029/2018GB006030.
14. Lynch, LM, NA Sutfin, TS Fegel, **CM Boot**, TP Covino, MD Wallenstein. 2019. River channel connectivity shifts metabolite composition and dissolved organic matter chemistry. *Nature Communications* 10:459. DOI: 10.1038/s41467-019-08406-8.
15. Shaw, EA, **CM Boot**, JC Moore, DH Wall, JS Baron. 2019. Long-term nitrogen addition shifts the soil nematode community to bacterivore-dominated and reduces its ecological maturity in a subalpine forest. *Soil Biology and Biochemistry* 130:177-184. DOI: 10.1016/j.soilbio.2018.12.007.
16. Hall, EK, ES Bernhardt, RL Bier, MA Bradford, **CM Boot**, JB Cotner, PA del Giorgio, SE Evans, EB Graham, SE Jones, JT Lennon, K Locey D Nemergut, B Osborne, JD Rocca, JS Schimel, MS Waldrop, MW Wallenstein. 2018. Understanding how microbiomes influence the systems they inhabit: insight from ecosystem ecology. *Nature Microbiology* 3:977-892. DOI: 10.1038/s41564-018-0201-z.
17. De, Prithwiraj, M McNeil, M Xia, **CM Boot**, D Hesser, K Deneff, C Rithner, K Dobos, D Hoft and D Chatterjee. 2018. Structural determinants in a glucose containing lipopolysaccharide from *Mycobacterium tuberculosis* critical for inducing a subset of protective T cells. *Journal of Biological Chemistry*. DOI: 10.1074/jbc.RA118.002582.
18. Schaeffer, SM, **CM Boot**, D. Roux-Michollet, J Schimel. 2017. Soil carbon and nitrogen dynamics though the summer drought in a California annual grassland. *Soil Biology and Biochemistry* 115:54-62, DOI:10.1016/j.soilbio.2017.08.009.
19. Carrillo, Y, C Bell, A Koyama, **CM Boot**, M Wallenstein, E Pendall. 2017. Plant traits, stoichiometry, and microbes as drivers of decomposition in the rhizosphere in a temperate grassland. *Journal of Ecology* 105(6):1750-1765, DOI:10.1111/1365-2745.12772.
20. Butnor, J, K Johnsen, S Zarnoch, **CM Boot**, T Stokes, J Jackson, L Samuelson, K Heckman, P Anderson, C Gonzalez-Benecke, F Cotrufo. 2017. Vertical distribution and persistence of soil organic carbon in fire-adapted longleaf pine forests. *Forest Ecology and Management* 360:15-26. <https://doi.org/10.1016/j.foreco.2017.01.014>

21. Angala, S, M McNeil, L Shi, M Joe, H Pham, S Zuberogoitia, J Nigou, **CM Boot**, T Lowary, M Gilleron, M Jackson. 2017. Biosynthesis of the methylthioxylose capping motif of lipoarabinomannan in *Mycobacterium tuberculosis*. *ACS Chemical Biology* 12(3):682-691, DOI:10.1021/acschembio.6b01071.
22. Sheflin, AM, EC Borresen, J Kirkwood, **CM Boot**, AK Whitney, S Lu, RJ Brown, CD Broeckling, EP Ryan, TL Weir. 2017. Dietary Supplementation with rice bran or navy bean alters gut bacterial metabolism in colorectal cancer survivors. *Molecular Nutrition and Food Research* 61(1):1-11, DOI:10.1002/mnfr.201500905.
23. Cotrufo, MF, **CM Boot**, D Brogan, ML Haddix, S Kampf, L MacDonald, P Nelson, S Ryan-Burkett, S Schmeer, E Hall. 2016. Redistribution of pyrogenic carbon from hillslopes to stream corridors following a large sub-alpine wildfire. *Global Biogeochemical Cycles* 30, DOI:10.1002/2016GB005467.
24. Cotrufo, MF, **CM Boot**, S Abiven, EJ Foster, ML Haddix, M Reisser, CM Wurster, MI Bird, MWI Schmidt. 2016. Quantification of pyrogenic carbon in the environment: An integration of analytical approaches. *Organic Geochemistry* 100:42-50, DOI:10.1016/j.orggeochem.2016.07.007.
25. **Boot, CM**, EK Hall, K Deneff, JS Baron. 2016. Long-term nitrogen amendments alter soil carbon and microbial community properties in a sub-alpine forest ecosystem. *Soil Biology and Biochemistry* 92:211-220.
26. Bier, R, E Bernhardt, **CM Boot**, E Graham, E Hall, J Lennon, D Nemergut, B Osborne, CR Gonzalez, J Schimel, M Waldrop, M Wallenstein. 2015. Linking microbial community structure and microbial processes: an empirical and conceptual overview. *FEMS Microbiology Ecology* 91:fiv113, DOI:10.1093/femsec/fiv113.
27. **Boot, CM**, ML Haddix, K Paustian, MF Cotrufo. 2015. Distribution of black carbon in Ponderosa pine forest floor and soils following the High Park Wildfire. *Biogeosciences* 12:3029-3039, DOI: 10.5194/bg-12-3029-2015.
28. Bell, C, Y Carrillo, **CM Boot**, JD Rocca, E Pendall, MD Wallenstein. 2014. Rhizosphere stoichiometry: are C:N:P ratios of plants, soils, and enzymes conserved at the plant species-level? *New Phytologist* 51: 505-517, DOI: 10.1111/nph.12531.
29. Cotrufo, MF, MD Wallenstein, **CM Boot**, K Deneff, E Paul. 2013. The microbial efficiency-matrix stabilization (MEMS) framework integrates plant litter decomposition with soil organic matter stabilization: Do labile plant inputs form stable soil organic matter? *Global Change Biology* 19(4): 988-995, DOI: 10.1111/gcb.12113.
30. **Boot, CM**, SM Schaeffer, JP Schimel. 2013. Static bacterial osmolyte pools during seasonal drought in a California grassland. *Soil Biology and Biochemistry* 57: 356-361, DOI:10.1016/j.soilbio.2012.09.005.
31. Carbone MS, AP Williams, AR Ambrose, E Bradley, **CM Boot**, TE Dawson, SM Schaeffer, JP Schimel, CJ Still. 2012. Cloud shading and fog drip influence the metabolism of a coastal pine ecosystem. *Global Change Biology* 19(2), 484-497. DOI: 10.1111/gcb.12054.
32. **Boot, CM**. Microbial response to drying and rewetting: osmotic and matric effects. 2011. *Plant and Soil* 348: 99-102, DOI 10.1007/s11104-011-0958-9.

33. Carbone, MS, CJ Still, AM Ambrose, TE Dawson, AP Williams, **CM Boot**, SM Schaeffer, JP Schimel. 2011. Seasonal and episodic moisture controls on plant and microbial contributions to soil respiration. *Oecologia*. DOI 10.1007/s00442-011-1975-3.
34. **Boot, CM**, NC Gassner, JE Compton, K Tenney, CM Tamble, RS Lokey, TR Holman, P Crews. 2007. Pinpointing pseurotins from a marine-derived *Aspergillus fumigatus* as tools for chemical genetics using a synthetic lethality yeast screen. *Journal of Natural Products* 70: 1672-1675.
35. **Boot, CM**, T Amagata, K Tenney, JE Compton, H Pietraszkiewicz, FA Valeriote, P Crews. 2007. Four classes of structurally unusual peptides from two marine-derived fungi. *Tetrahedron* 63: 9903-9914.
36. **Boot, CM**, K Tenney; FA Valeriote, P Crews. 2006. Highly N-methylated linear peptides produced by an atypical *Acremonium* sp. *Journal of Natural Products* 69: 83-92.

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#### TEACHING

- 2020 Instructor, The Science of Ecosystem Measurement, CSU (ECOL 592)
- 2019 Guest Lecturer, Soil Microbiology, CSU (SOCR 455/555)
- 2019 Guest Lecturer, Instrumental Analysis, CSU (CHEM 431)
- 2019 Guest Lecturer, Foundations of Analytical Chemistry, CSU (CHEM 232)
- 2016 Co-organizer and Instructor, Advanced Topics in NMR and Mass Spectrometry, Central Instrument Facility, CSU
- 2015 Co-organizer and Instructor in the Summer Soil Institute, CSU
- 2015 Co-instructor, Foundations of Ecosystem Science, CSU (ESS 211)
- 2014 – 2015 Guest Lecturer, Ecosystem Ecology
- 2014 Co-instructor, Soil Plant Nutrient Relations, CSU (SOCR 540)
- 2012 – 2016 Workshop Leader, CSU, Collecting and Managing Data, Skills for Undergraduate Participation in Ecological Research (SUPER)
- 2006 Teaching Assistant, UCSC, Biochemistry (BIOL 100)
- Teaching Assistant, UCSC, Organic Chemistry (CHEM 108B)
- 2001 Teaching Assistant, UCSC, Life in the Sea (OCEA 80A)
- Teaching Assistant, UCSC, Genetics (BIOL 105)

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#### PROFESSIONAL DEVELOPMENT/TRAINING/CERTIFICATIONS

- 2021 Microaggressions and Inclusive Language, Colorado State University, Fort Collins, CO
- 2021 Uncovering Bias, Colorado State University, Fort Collins, CO
- 2021 Diversity and Inclusion, Colorado State University, Fort Collins, CO
- 2019 Mindset for Supervisors, Colorado State University, Fort Collins, CO
- 2010 Summer Soil Institute, Colorado State University, Fort Collins, CO

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#### SERVICE

Mentoring—Stephanie Lemas (nee Cardinalli), GDPE Masters student advisor (2022-present); Siwook Hwang, GDPE PhD student committee (2020-present); Emily Blackaby, GDPE Master's student committee (2023-2023); LeAundra Schopflin, GDPE PhD student committee (2022-2023); Caitlin Charlton, GDPE Master's student committee (2019-2021); Timothy Weinmann, GDPE Master's student Co-Advisor (2017-2020); Allison Haase, CIF GRA (2019-2020); Cheryle Buening, CIF GRA (2018-1019); Kaylen Obray, Chemistry Master's student and Bruker NMR Validation Scholar (2016-2017); Laurel Lynch, GDPE PhD student committee (2014-2017); Timothy Fegal, GDPE

Master's student committee (2013-2016); Lisa Windom, ESS undergraduate SUPER student (2012-2014)

Editorial and Review—*Proposal Review*: DOE EMSL general science theme (2015, 2016, 2018, 2019), NSF DEB Ecosystem Science pre-proposal (2017), NSF Arctic Natural Sciences (2016), ESA Sulzman award (2013-2015), NASA ROSES Arctic-Boreal Carbon Cycle (2013); *Journal Editor*: Plant and Soil (2010 – 2014); *Manuscript Review*: Journal of Ecology, Environmental Science and Technology, Biogeochemistry, Ecology, Soil Biology and Biochemistry, Global Change Biology, International Society of Microbial Ecology (ISME) Journal, Journal of Geophysical Research, Plant and Soil, Tetrahedron, and Journal of Natural Products

K-12 Outreach—Host for Lincoln Middle School AVID (Advancement Via Individual Determination) student science day (2019; 2022-2023); Designated Science Line Responder: Answer online questions for middle and high school students (2009 – 2015); 'Soil Science' Talk for 8<sup>th</sup> grade field trip to University of California Sedgwick Reserve (2009)

Undergraduate Outreach—Host for Northeastern Junior College student instrumentation demonstration (2017-2019); Host for Hendrix College NSF funded [EPROACH](#) students (Experiences in Professional Research Organization and Atmospheric Chemistry at Hendrix) (2019); Co-Founder (2013) and workshop leader (2013-2015) [SUPER](#) (Skills for Undergraduate Participation in Ecological Research' training program at NREL; 'How to Use Power Point' workshop for [ACCESS](#) (Baccalaureate Bridge to the Biomedical Sciences, summers, 2003 – 2007); Research talks at Cabrillo Community College, Aptos, CA, and Monterey Peninsula College, Monterey, CA; for ACCESS program (summers, 2002 – 2003); Volunteer Mentor, [STEM Diversity Program](#), UCSC (summers, 2001 – 2007)

University Service—Chair of ARC Diversity, Equity, Inclusion and Justice Committee (2021-present), Representative on CSU Chemistry Climate and Culture Committee (2021-present), Student Presentation Judge at the Front Range Student Ecology Symposium (2016-present, annually), Representative on Chemistry Communications Committee, CSU (2015-2017), NREL Strategic Planning Committee, CSU (2015); NREL Scholarship Panel, CSU (2011-2015); Seminar Coordinator NREL New Voices in Ecology, CSU (2011); Graduate Student Representative on Diving Control Board, UCSC (2002 – 2007); Organizing Committee for First Annual Ocean Sciences Graduate Student Symposium, UCSC (2005 – 2006)

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## SYNERGISTIC ACTIVITIES

### Conference Session & Workshop Organizer

Steering Committee for the inaugural Northern Colorado Winter Symposium on Key Instrumentation (WiSKI). Fort Collins, CO. March 25<sup>th</sup> – 27<sup>th</sup> 2019. Co-organizers: Karolien Deneff, Corey Broeckling, Christopher Rithner.

Practical Applications of NMR in Industry Conference. NMR Validation Workshop. Hilton Head Island, SC. March 7<sup>th</sup> 2019. Co-organizers: Elina Zailer, Christoph Freudenberger, Dan Sorensen, Jose Napolitano, Joseph Ray, Micheal Maiwald, Kristie Adams, Torsten Schoenberger.

Organizer, Waters Learn at Lunch. Introduction to Mass Spec Analysis and Analysis of Polar Compounds Using HILIC Chromatography. Fort Collins, CO. December 4<sup>th</sup> 2018. Co-organizers: Karolien Deneff, Jesse Canales, Stephen Griffin.

Practical Applications of NMR in Industry Conference. NMR Validation Workshop. Hilton Head Island, SC. February 24<sup>th</sup> 2017. Co-organizers: Kaylen Obray, Kim Colson, Kristie Adams, Torsten Schoenberger.

American Geophysical Union Chapman Conference. Soil-mediated drivers of coupled biogeochemical and hydrological processes across scales. Biosphere II, Tucson, AZ. October 21<sup>st</sup> – 24<sup>th</sup>, 2013. Co-convenor: Matthew Wallenstein.

American Geophysical Union. From plant litter decay to soil organic matter formation: the missing nexus. San Francisco, CA. December 4<sup>th</sup> – 7<sup>th</sup>, 2012. Co-convenors: M. Francesca Cotrufo, Karolien Deneff.

Ecological Society of America. Microbial responses to moisture availability: scaling up from physiology to ecosystem-level processes. Austin, TX. August 8<sup>th</sup>-12<sup>th</sup>, 2011. Co-convenors: Stephanie N. Kivlin, Bonnie G. Waring, Sean M. Schaeffer.

#### Workshop Participant (\*invited)

Long Term Ecological Research Workshop. Linking aquatic and soil organic matter across ecosystems through characterization of optical properties. Boulder, CO. May 1<sup>st</sup> – 3<sup>rd</sup>, 2013. Conveners: Diane McKnight, Rudolf Jaffe

\*Heterotrophic Respiration Workshop. Andrews Experimental Forest, Blue River, OR. October 29<sup>th</sup> – Nov 1<sup>st</sup> 2012. Conveners: Mark Harmon, Rodrigo Vargas, Ben Bond-Lamberty.

\*John Wesley Powell Center for Center for Analysis and Synthesis. The Next Generation of Ecological Indicators: Defining Which Microbial Properties Matter Most to Ecosystem Function and How to Measure Them. Fort Collins, CO. September 3<sup>rd</sup>-7<sup>th</sup>, 2012 and May 13<sup>th</sup>-17<sup>th</sup>, 2013. Conveners: Ed Hall, Matt Wallenstein and Jay Lennon.

Earth Science Women's Network Career Development Workshop. Skills for Networking and Communication. Madison, WI. June 4<sup>th</sup> – 6<sup>th</sup>, 2012.

#### Media, Popular Press and Panels

[Feature article](#) in CSU, The Source: W.M. Keck Foundation awards CSU \$1 million to study rare sugars fundamental to biology (Feb 2021)

Microbiome Group: Order from Chaos, Lab Organization Strategies Panelist (October 2019)

[Feature article](#) in CSU, The Source: Cross-college Collaboration Leads to Watershed Pyrogenic Carbon Research Breakthroughs (Oct 2016)

School of Global Environmental Sustainability (SOGES) and Biodiversity Working Group (BWG) Panelist: Women in Science: Challenges and Balances (March 2014)

Invitee to White House event announcing NSF's family friendly policies; [Press article](#) published in CSU Life (Sept. 2011)

American Geophysical Union [Online Profile](#) of Younger Scientists (July 2009)

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#### PRESENTATIONS (\*invited; **current or former student or postdoc advisee**)

American Geophysical Union; San Francisco, CA. Dec 10<sup>th</sup> – 11<sup>th</sup>, 2023

**Oral Presentation:** Moving beyond stoichiometry: Simple substrates do not fully capture complex pathways of root exudate decomposition. **Laurel Lynch**, Megan Machmuller, Malak M Tfaily, M Francesca Cotrufo, Chao Liang, Rosalie Chu, Matthew D Wallenstein, Claudia M Boot.

Poster Presentation: Sugars in Soils: A Chemical Analysis of Soil Hexoses by Gas Chromatography/Mass Spectrometry. **Stephanie Cardinalli-Lemas**, Allison Haase, Bethany Avera, Richard T Conant, Claudia M Boot.

Poster Presentation: Fire Impacts on Soil Organic Matter and Metabolome: Implications for Microbial Metabolism. Jacob VanderRoest, Julie Fowler, Holly K Roth, Corey Broeckling, Timothy Fegel, Amy M McKenna, Emily Bechtold, Claudia M Boot, Charles Rhoades, Michael J Wilkins and Thomas Borch.

Oral Presentation: Microbial Metabolism of Rare Sugars, Short Term Persistent and their Potential for Carbon Sequestration. Claudia M Boot, Bethany Avera, Stephanie Cardinalli-Lemas, Deanna Gribb, Peter Baas, James Henriksen and Richard T Conant

\*Soil and Crop Sciences Department, Colorado State University; Fort Collins CO. October 8<sup>th</sup>, 2023  
Departmental Seminar: Decoding Destiny: Understanding the Molecular Blueprint for the Fate of Organic Matter in Soils. Claudia M Boot

American Society of Mass Spectroscopy; Houston, TX. June 4<sup>th</sup> – 8<sup>th</sup>, 2023  
Poster Presentation: Development of a self-service LC-QTOF-based metabolomics training workflow in an open access core facility. Paul Mathews, Claudia M Boot

American Society of Pharmacognosy; Charleston, SC. July 22<sup>nd</sup> – 26<sup>th</sup>, 2022  
Poster Presentation: The shadow metabolism of L-sugars and their potential for carbon sequestration. Claudia M. Boot, **Bethany Avera**, **Stephanie Cardinalli**, **Allison Haase**, Peter Baas, Minjae Kim, James Henriksen, Rich Conant

Soil Ecology Society; PNNL Richland WA. May 17<sup>th</sup>-19<sup>th</sup>, 2022  
Oral Presentation: Through the Looking Glass: The Potential of L-sugars for Soil Carbon Sequestration. **Bethany Avera**, Michaela Burnley, **Stephanie Cardinalli**, Peter Baas, Rich Conant, Claudia Boot

Front Range Microbiome Symposium; Fort Collins, CO. April 14<sup>th</sup>-15<sup>th</sup>, 2022  
Poster Presentation: The shadow metabolism of L-sugars and their potential for carbon sequestration. Claudia M. Boot, **Bethany Avera**, **Stephanie Cardinalli**, **Allison Haase**, Peter Baas, Minjae Kim, James Henriksen, Rich Conant

Ecological Society of America; Virtual Meeting. August 3<sup>rd</sup> – 6<sup>th</sup>, 2020  
Oral Presentation: Ecosystem response to long-term nitrogen fertilization suggests a stabilizing feedback mitigating against elevated nitrification, acidification and cation leaching. **T Weinmann**, JS Baron, TP Covino, CC Rhoades, CM Boot

Goldschmidt; Virtual Meeting. June 21<sup>st</sup>-26<sup>th</sup>, 2020  
Oral Presentation: The impact of land use change on the ecosystem metabolome of a forested watershed. CM Boot, A Haase, T Fegel, C Rhodes, TP Covino

Rocky Mountain National Park Research Conference; Estes Park, CO. March 10<sup>th</sup>-11<sup>th</sup>, 2020  
Oral Presentation: Heterogeneity in soils and forest stands may explain a complex response to nitrogen addition in old-growth subalpine forests. **T Weinmann**, JS Baron, T Covino, CC Rhodes, CM Boot

Soil Science Society of America; San Antonio, TX. November 10<sup>th</sup> – 13<sup>th</sup>, 2019  
Oral Presentation: Coupling DRIFT spectroscopy and BPCA techniques to quantify pyrogenic carbon in soils across Europe. Y Pressler, C Boot, S Abiven, E Lugato, MF Cotrufo



American College of Sports Medicine; San Francisco, CA. May 26<sup>th</sup> – May 30<sup>th</sup>, 2019

Poster Presentation: The effects of a protease enzyme blend on the amino acid response to resistance exercise. J Morimune, JR Townsend, MD Jones, **CN Beuning**, **AA Haase**, CM Boot, LA Littlefield, RN Henry, AC Marshall, TA VanDusseldorp, Y Feito, GT Mangine

\*Waters Hemp/Cannabis Symposium; Golden, CO. April 23<sup>rd</sup>, 2019

Oral Presentation: Complementary analytical approaches for describing the molecular composition of cannabis extracts. CM Boot, K Denef, C Rithner

European Geophysical Union; Vienna, Austria. April 7<sup>th</sup> – 12<sup>th</sup>, 2019

Oral Presentation: Moving beyond stoichiometry: Simple substrates do not fully capture complex pathways of root exudate decomposition. **L Lynch**, M Tfaily, M Machmuller, F Cotrufo, C Liang, R Chu, CM Boot, MD Wallenstein, J Lehmann

\*Winter Symposium on Key Research Instrumentation; Fort Collins, CO. March 25<sup>th</sup>-27<sup>th</sup>, 2019

Oral Presentation: Metabolomics as a systems tool for understanding ecosystem responses to environmental drivers. CM Boot

Soil Science Society of America International Soils Meeting; San Diego CA. January 6<sup>th</sup> – 9<sup>th</sup>, 2019

Oral Presentation: Persistent effects of forest harvest on dissolved organic matter composition in subsurface hillslope leachate. TS Fegel, B Starr, K Elder, T Covino, EK Hall, C Boot, C Rhoades

American Geophysical Union; Washington DC. December 10<sup>th</sup> – 14<sup>th</sup>, 2018

\*Oral Presentation: Metabolomics as a systems tool for understanding ecosystem responses to environmental drivers: Three case studies. CM Boot

Oral Presentation: Linking hillslopes to river corridors to understand dissolved organic matter export at the watershed scale. TP Covino, T Weiss, T Fegel, L Lynch, AC Brooks, C Rhodes, E Whol, CM Boot, E Hall

MtnClim; Crested Butte, CO. September 17<sup>th</sup> – 21<sup>st</sup>, 2018

Poster Presentation: Molecular and watershed-scale drivers of soil C loss following N enrichment. **T Weinmann**, CM Boot, J Baron, C Rhoades, T Covino

Metabolomics Society; Seattle, WA. June 24<sup>th</sup> – 28<sup>th</sup>, 2018

Poster Presentation: The influence of drought on the soil microbiome: An ecosystem metabolomics perspective. CM Boot, S Evans

American Society of Mass Spectrometry; San Diego, CA. June 3<sup>rd</sup> – 7<sup>th</sup>, 2018

Poster Presentation: Decontamination of Pesticide-Exposed Clothing: Differential Effects of Washing and Drying Types Determined by GC MS/MS and LC MS/MS. CM Boot, K Denef, M Burnett, J Edwards, T Walker

Ecological Society of America; Portland, OR. August 6<sup>th</sup> – 11<sup>th</sup>, 2017

Poster Presentation: Hillslope connectivity and DOC export from an Arctic catchment. **L Lynch**, T Covino, CM Boot, M Machmuller, M Wallenstein

American Society of Pharmacognosy; Portland, OR. July 29<sup>th</sup> – August 2<sup>nd</sup>, 2017

Poster Presentation: Material Validation by NMR: Significance and Implementation. KB Killday, **K Obroy**, CM Boot, T Schoenberger, K Adams and KL Colson

Soil Ecology Society; Fort Collins, CO. June 5<sup>th</sup> – 9<sup>th</sup>, 2017

Oral Presentation: Advancing the understanding of organo-mineral interactions: Insights from nano-scale secondary ion mass spectrometry. M Machmuller, C Muller, J Soong, C Hoeschen, CM Boot, F Cotrufo

American Society of Mass Spectrometry; Indianapolis, IN. June 4<sup>th</sup> – 8<sup>th</sup>, 2017

Poster Presentation: GCMS and NMR based chemometrics of distillates. MJ Riches, **K Obroy**, K Denef, CM Boot, C Rithner

Institute of Cannabis Research; Pueblo, CO. April 28<sup>th</sup> – 30<sup>th</sup>, 2017

Oral Presentation: Complementary Analytical Approaches for Describing the Molecular Composition of Cannabis Extracts. CM Boot, K Denef, E Bridge, C Rithner

European Geosciences Union; Vienna, Austria. April 23<sup>rd</sup> – 28<sup>th</sup>, 2017

Oral Presentation: Pyrogenic carbon redistribution from hillslopes to stream corridors following a large montane wildfire. MF Cotrufo, CM Boot, ML Haddix, S Schmeer, S Kampf, D Brogan, P Nelson, CC Rhoades, S Ryan-Burkett, S Rathburn, EK Hall

Practical Applications of NMR in Industry Conference; Hilton Head, SC. February 20<sup>th</sup> – 23<sup>rd</sup>, 2017

Poster Presentation: NMR validation: significance, implementation, and awareness. **K Obroy**, CM Boot, K Colson, T Schoenberger, K Adams

American Geophysical Union; San Francisco, CA. December 12<sup>th</sup> – 16<sup>th</sup>, 2016

Poster Presentation: A long-term forest fertilization experiment to understand ecosystem responses to atmospheric nitrogen deposition. J Baron, SM Advani, J Allen, CM Boot, K Denef, S Denning, E Hall, JC Moore, H Reuth, M Ryan, E Shaw, D Bowker

American Society of Mass Spectrometry; San Antonio, TX. June 5<sup>th</sup> – 9<sup>th</sup>, 2016

Poster Presentation: Electrospray Ionization Analysis of Dextran and Carboxymethylated Dextran. JB Tapia, K Denef, CM Boot, MM Reynolds

American Geophysical Union; San Francisco, CA. Dec 14<sup>th</sup> – 18<sup>th</sup>, 2015

Oral Presentation: Differences in dissolved organic matter lability between alpine glaciers and alpine rock glaciers of the American West. EK Hall, **TS Fegal** J Baron, CM Boot

Poster Presentation: Characterizing soil organic carbon recalcitrance in longleaf pine (*Pinus palustris* Mill) stands. JR Butnor, LJ Samuelson, PH Anderson, CA González Benecke, CM Boot, MF Cotrufo, KA Heckman, JA Jackson, KH Johnsen, TA Stokes, and CW Swanston

Soil Organic Matter Meeting; Gottingen, Germany. Sept 20<sup>th</sup> – 24<sup>th</sup>, 2015

Oral Presentation: Toward and accurate quantification of truly old SOC: an integration of analytical approaches to estimate pyrogenic carbon. MF Cotrufo, CM Boot, S Abiven, E Foster, Moritz, M Bird, M Schmidt.

Ecological Society of America; Baltimore, MD. Aug 9<sup>th</sup> – 14<sup>th</sup>, 2015

Oral Presentation: Microbial community dynamics and relationship with biogeochemical cycling across season in Arctic tundra. CM Boot, A Koyama, K Buckeridge, SM Schaeffer, J Ernakovich, J Schimel, M Wallenstein

\*Environmental Molecular Sciences Laboratory; Richland, WA. May 19<sup>th</sup>, 2015

Soil Science Seminar: Analytical approaches for understanding shifts in organic matter composition driven by environmental change. CM Boot

\*Technical University Munich; Freising, Germany. May 7<sup>th</sup>, 2015

Soil Science Seminar: From Plants to SOM: pathways and controls. MF Cotrufo, CM Boot, J Soong

Hydrology Days, CSU; Fort Collins, CO. March 24<sup>th</sup>, 2015

Oral Presentation: Transport of black carbon across the soil aquatic interface following wildfire: contributions of short and long-term controls. CM Boot, MF Cotrufo, ML Haddix, S Schmeer, S Kampf, D Brogan, P Nelson, CC Rhoades, S Ryan-Burkett, S Rathburn, EK Hall

American Chemical Society; Denver, CO. March 22<sup>nd</sup> – 26<sup>th</sup>, 2015

Oral Presentation: Meta-metabolomics as a systems-level tool for examining shifts in organic matter composition driven by environmental change. CM Boot

American Geophysical Union; San Francisco, CA. December 15<sup>th</sup> -19<sup>th</sup>, 2014

Oral Presentation: Transport of black carbon across the terrestrial-aquatic interface following wildfire: contributions of short and long-term controls. CM Boot, MF Cotrufo, ML Haddix, S Schmeer, S Kampf, D Brogan, P Nelson, CC Rhoades, S Ryan-Burkett, S Rathburn, EK Hall

Oral Presentation: Evaluating multiple drivers of soil organic matter lability and structure in a sub-alpine forest ecosystem. E Hall, **TS Fegal**, CM Boot

Poster Presentation: The SUPER program: a research-based undergraduate experience. JG Ernakovich, R Boone, CM Boot, K Denef, JM Lavallee, J Moore and MD Wallenstein.

Natural Resource Ecology Laboratory, CSU; Fort Collins, CO. Nov 20, 2014

Seminar: Molecular biomarkers for integrated belowground metabolism. CM Boot

Goldschmidt Meeting; Sacramento, CA. June 8<sup>th</sup>-13<sup>th</sup>, 2014

Poster Presentation: Climate effects on plant and microbial metabolism in grassland soil porewater. CM Boot, MD Wallenstein, E Pendall

European Geophysical Union; Vienna, Austria. April 27<sup>th</sup> – May 2<sup>nd</sup>, 2014

Poster Presentation: Black carbon dynamics in soil from the watershed to the microbial scale. MF Cotrufo, CM Boot, K Denef, E Foster, M Haddix, X Jiang, J Soong, C Stewart

\*Front Range Student Ecology Symposium, CSU; Fort Collins, CO. February 19<sup>th</sup>, 2014

IGNITE!: Integrating organic matter structure with ecosystem function. CM Boot

American Geophysical Union; San Francisco, CA. Dec 9<sup>th</sup> – 13<sup>th</sup>, 2013

Poster: Biogeochemical signatures of glacier and rock glacier outflow in the western United States. **T Fegal**, J Baron, E Hall and CM Boot

Poster: Changing conditions in alpine and sub-alpine lakes. J Baron, E Hall, G Gundersen, A Seback, **L Windom**, R Woodwell, J Heath, CM Boot

\*University of Northern Colorado; Greeley, CO. Nov 21<sup>st</sup>, 2013

Biology Department Seminar: Assessing the effects of global change on organic matter composition: what does molecular structure tell us? CM Boot

\*University of Wyoming; Laramie, WY. Nov 1<sup>st</sup>, 2013

Botany Department Seminar: Assessing the effects of global change on organic matter composition: what does molecular structure tell us? CM Boot

Geological Society of America; Denver, CO. Oct 27<sup>th</sup> – 30<sup>th</sup>, 2013

Poster Presentation: Accounting for pyrogenic carbon stocks in the Cache la Poudre watershed following the High Park Fire. CM Boot, ML Haddix, K Paustian, MF Cotrufo

- \*American Geophysical Union Chapman Conference. Biosphere II, Tucson, AZ. Oct 21<sup>st</sup> – 24<sup>th</sup>, 2013  
Oral Presentation: Lability and composition of D(E)OM at the terrestrial aquatic interface in a subalpine forest. CM Boot, E Hall, **L Windom**, JS Baron
- Ecological Society of America; Minneapolis, MN. Aug 12<sup>th</sup> – 16<sup>th</sup>, 2013  
Oral Presentation: Quantities and qualities: a story of N amendments in a subalpine forest. CM Boot, E Hall, K Denef, JS Baron  
Workshop Presentation: Resources for Ecology Education Fair and Share (REEFS). SUPER: Skills for Undergraduate Participation in Ecological Research. CM Boot, JG Ernakovich.
- \*American Geophysical Union; San Francisco, CA. Dec 3<sup>rd</sup> – 9<sup>th</sup>, 2012  
Oral Presentation: Integrating organic matter structure with ecosystem function using advanced analytical chemistry techniques. CM Boot  
Oral Presentation: The dual Filter model: labile plant inputs from stable soil organic matter. MF Cotrufo, MD Wallenstein, CM Boot, K Denef, EA Paul
- Channel Islands Symposium; Ventura, CA. Oct 23<sup>rd</sup> – 26<sup>th</sup> 2012  
Oral Presentation: Dynamic response of forest litter and mineral soil to pulsed water additions. CM Boot, SM Schaeffer, MS Carbone, CJ Still, JP Schimel
- \*University of Wisconsin; Madison, WI. Oct 3, 2012  
Soil Science Department Seminar: Towards linking soil organic matter with ecosystem function via microbial metabolism. CM Boot
- Ecological Society of America; Portland, OR. Aug 5<sup>th</sup> -10<sup>th</sup>, 2012  
Oral Presentation: Seasonal and vegetation driven dynamics of dissolved organic matter in Arctic tundra soil. CM Boot, MD Wallenstein, JP Schimel
- American Geophysical Union; San Francisco, CA. Dec 4<sup>th</sup>-9<sup>th</sup>, 2011  
Poster Presentation: Seasonal changes drive chemical composition of Arctic dissolved organic matter. CM Boot, MD Wallenstein, JP Schimel
- Arctic LTER Symposium; Woods Hole, MA. Feb 18<sup>th</sup> – 20<sup>th</sup>, 2011  
Poster Presentation: Composition of dissolved organic matter in Arctic soils. Claudia M. Boot, Sean M. Schaeffer, Matthew D. Wallenstein, JP Schimel
- \*Natural Resource Ecology Laboratory, Fort Collins, CO. Jan 21, 2011  
NREL Seminar Series: New Voices in Ecology: Views from Early Career Scientists. What is the physiological response of microbes to drought? CM Boot
- American Geophysical Union; San Francisco, CA. Dec 13<sup>th</sup>-17<sup>th</sup>, 2010  
Oral Presentation: Dynamic response of forest litter and mineral soil to pulsed water additions. Claudia M. Boot, Sean M. Schaeffer, Mariah S. Carbone, Christopher J. Still and Joshua P. Schimel  
Oral Presentation: Effect of speed and intensity of freezing on microbial C and N cycling in two arctic tundra soils. SM Schaeffer, CM Boot, JP Schimel, S Sistla, D Roux-Michollet
- International Society for Microbial Ecology; Seattle, WA. Aug 23<sup>rd</sup>-27<sup>th</sup>, 2010  
Poster Presentation: What is the physiological response of microbes to drought? CM Boot, SM Schaeffer, AP Doyle, JP Schimel
- World Congress of Soil Science; Aug 1<sup>st</sup> – 6<sup>th</sup>, 2010  
Oral Presentation: The biogeochemistry of drought. JP Schimel, CM Boot, P Holden, D Roux-Michollet, S Parker, SM Schaeffer, K Treseder

- European Geophysical Union; Vienna, Austria. May 2<sup>nd</sup> – 7<sup>th</sup>, 2010  
Poster Presentation: Moisture Pulse and soil respiration dynamic of a bishop pine forest in a Mediterranean type climate. MS Carbone, CM Boot, SM Schaeffer, JP Schimel, CJ Still
- State of the Arctic Meeting; Miami, FL. Mar 15<sup>th</sup>-19<sup>th</sup>, 2010  
Poster Presentation: Composition of dissolved organic matter in Arctic soils. CM Boot, SM Schaeffer, MD Wallenstein, JP Schimel
- American Geophysical Union; San Francisco, CA. Dec 14<sup>th</sup> – 18<sup>th</sup>, 2009  
Poster Presentation: Moisture controls on soil respiration sources in a pine forest on Santa Cruz Island, CA. MS Carbone, A Ambrose, CM Boot, TE Dawson, SM Schaeffer, J Schimel, CJ Still, P Williams
- Ecological Society of America; Albuquerque, NM. Aug 2<sup>nd</sup>-7<sup>th</sup>, 2009  
Oral Presentation: Microbial tools for drought survival in a California grassland. Claudia M. Boot, Sean M. Schaeffer, Allen P. Doyle, and Joshua P. Schimel  
Oral Presentation: Effects of summertime fog and winter rain on soil carbon and nitrogen dynamics in a Bishop pine forest. SM Schaeffer, MS Carbone, CM Boot, JP Schimel, CJ Still
- American Geophysical Union; San Francisco, CA, Dec 14<sup>th</sup>-19<sup>th</sup>, 2008  
Poster Presentation: Quantification of microbial osmolytes in a drought impacted California grassland. CM Boot, SM Schaeffer, AP Doyle, JP Schimel
- 12<sup>th</sup> International Symposium on Marine Natural Products; Queenstown, NZ, Feb 4<sup>th</sup> – 9<sup>th</sup>, 2007  
Oral Poster Presentation: Comparative analysis of the human solid tumor selectivity of efrapeptins isolated from an unidentifiable marine-derived fungus. CM Boot, K Tenney, FA Valeriote and P Crews
- Society for Industrial Microbiology Annual Meeting and Exhibition; Denver, CO, July 29<sup>th</sup> – Aug 2<sup>nd</sup>, 2007  
Oral Presentation: Discovering significant biomolecules from marine-derived fungi. P Crews, CM Boot, T Amagata, J Compton
- Gordon Research Conference on Marine Natural Products; Ventura, CA, Feb 26<sup>th</sup> – Mar 3<sup>rd</sup>, 2006  
Poster Presentation: Probing ocean depths for phylogenetically divergent fungi. CM Boot, K Tenney, FA Valeriote, P Crews
- American Society of Pharmacognosy; Corvallis, OR, July 23<sup>rd</sup> – 27<sup>th</sup>, 2005  
Poster Presentation: Highly N-methylated linear peptides produced by an atypical marine sponge-derived strain of Acremonium. CM Boot, K Tenney, FA Valeriote, P Crews
- Joseph F. Bunnett Organic Chemistry Symposium; Santa Cruz, CA, May 7<sup>th</sup>, 2004  
Poster Presentation: Antimicrobial metabolites from an atypical marine-derived strain of Acremonium. CM Meents (Boot), FA Valeriote, P Crews
- \*University of the South Pacific; Department of Chemistry, Suva, Fiji. Sept 9, 2002  
Oral Presentation: Microbial communities in marine sponges: current research and future directions. CM Meents (Boot), P Crews

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#### FIELD RESEARCH SITES/TRAINING/CERTIFICATIONS

2016-2020	Colorado (LVWS, Fraser Experimental Forest)
2015	Colorado (LVWS)
2013-2014	Wyoming (PHACE), Colorado (LVWS, and Cache La Poudre (CLP) watershed)

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2012	Alaska (Toolik Field station, Institute of Arctic Biology), Wyoming (PHACE), Colorado (Loch Vale watershed (LVWS) in Rocky Mountain National Park)
2011	Alaska (Toolik Field Station, Institute of Arctic Biology), Wyoming (Prairie Heating and Carbon Dioxide Enrichment (PHACE))
2007-2010	Alaska (Toolik Field Station, Institute of Arctic Biology); California (Sedgwick Reserve, Santa Cruz Island Reserve)
2005	Solomon Islands (Guadalcanal), Papua New Guinea (Milne Bay, New Ireland)
2004	California (Monterey Bay), US Virgin Islands (St. Thomas)
2003	Vanuatu (Mele Bay), Papua New Guinea (Milne Bay), US Virgin Islands (St. Thomas)
2002	Vanuatu (Mele Bay), Fiji (Beqa Lagoon)
2002	American Association of Underwater Sciences (AAUS) Scientific Diving Certification
2000	Field Course, Center for Marine Resource Studies, Turks and Caicos Island

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#### CURRENT PROFESSIONAL AFFILIATIONS

American Chemical Society (ACS)  
 American Society of Mass Spectrometry (ASMS)  
 Ecological Society of America (ESA)  
 Earth Science Women's Network (ESWN)  
 Colorado Biological Mass Spectrometry Society (CBMSS)  
 Metabolomics Society  
 American Geophysical Union (AGU)  
 Iota Sigma Pi – National Honor Society for Women in Chemistry

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#### REFERENCES

Karolien Deneff Director Materials and Molecular Analysis Analytical Resources Core Colorado State University Fort Collins, CO 80523-1872 p: 970-491-6475 e: <a href="mailto:karolien.denef@colostate.edu">karolien.denef@colostate.edu</a>	Joshua P. Schimel Professor Department of Ecology Evolution and Marine Biology University of California Santa Barbara, CA 93016 p: 805-893-7866 e: <a href="mailto:schimel@lifesci.ucsb.edu">schimel@lifesci.ucsb.edu</a>	Phillip Crews Professor Department of Chemistry and Biochemistry University of California Santa Cruz, CA 95064 p: 831-459-2603 e: <a href="mailto:pcrews@ucsc.edu">pcrews@ucsc.edu</a>
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