

MALLORY P. LADD

Summary: Analytical chemist with over 5 years of experience researching climate change effects on terrestrial ecosystems, including permafrost soils in the Alaskan Arctic; with interests in science policy & diplomacy

EDUCATION

- Ph.D.** Energy Science & Engineering, *expected completion 2018*
University of Tennessee, Bredesen Center for Interdisciplinary Research & Graduate Education, Knoxville, TN, **Adviser:** Dr. Robert Hettich, Oak Ridge National Laboratory, Mass Spectrometry & Laser Spectroscopy Group
- B.Sc.** Chemistry, *Magna Cum Laude*, Departmental & University Honors
Honors Thesis Adviser: Dr. Wendell Griffith, Department of Chemistry, University of Toledo, Toledo, OH

RESEARCH EXPERIENCE

- 2013-present: **National Science Foundation Graduate Research Fellow**
Next-Generation Ecosystem Experiments (NGEE-Arctic) Project
Oak Ridge National Laboratory, Oak Ridge, TN
- Developed and implemented molecular approaches to assess interacting effects of soil biogeochemistry and climate change in Arctic ecosystems
 - Coordinated with collaborators at Lawrence-Berkeley National Laboratory to co-locate soil chemistry, microbial community, and greenhouse gas flux measurements at remote field sites near Barrow, AK and Nome, AK
 - Secured over \$200K from multiple sources to fund research activities, field work, supplies, and travel
 - Created website to communicate research findings to broader public: <http://malloryladd.com>
- 2011-2013: **Lab & Field Research Technician**, Ecosystem and Soil Ecology Laboratory
Environmental Sciences Department, University of Toledo, Toledo, OH
- Monitored seasonal Arctic soil nitrogen availability in response to warming
 - Organized research & logistics for two field expeditions to a remote area of the Arctic on the northern slope of the Alaskan Brooks Range Mountains
 - Contributed to a multidisciplinary, collaborative project with scientists from the University of Toledo, University of California - Santa Barbara, and Colorado State University
 - Hired, supervised, trained, & mentored five laboratory assistants
- 2009-2011: **Research Assistant**, Bioanalytical & Mass Spectrometry Laboratory
Department of Chemistry, University of Toledo, Toledo, OH
- Designed & implemented study that utilized protein chemistry & mass spectrometry to examine structure and sequence of hemoglobin from various mammals to uncover mechanism for red blood cell aging
 - Secured over \$4K to fund research activities, supplies, and conference travel
 - Completed honors thesis on research results
- 2008: **Research Assistant**, Organic Synthesis Laboratory
Department of Chemistry, University of Toledo, Toledo, OH
- Developed skills in organic synthesis and medicinal chemistry, including infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy

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Social Media

LinkedIn

<https://www.linkedin.com/in/malloryladd/>

Key Skills

Research, critical thinking, problem-solving, technical writing, public speaking, project management, team management, adaptability, multicultural sensitivity

Technical Skills

Mass spectrometry, liquid chromatography, nanoESI, U/HPLC, Orbitrap HRMS/MS, Dionex & ThermoFisher software, liquid sample prep and protocol development, infrared gas analysis, soil water retention and lysimetry, colorimetric & fluorometric enzyme and metabolite assays, soil core sectioning and extraction for molecular characterization

Computational Skills

Thermo XCalibur, Perseus, Inferno, MSCluster, MZmine, EndNote, Adobe Illustrator, Microsoft Office

Languages

English – ILR Level 5
Native/bilingual proficiency

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Spanish – ILR Level 2
Limited working proficiency

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PUBLICATIONS

Peer-Reviewed Journals

Darrouzet-Nardi, A., **Ladd, M.P.**, Weintraub, M.N., (2013) Fluorescent microplate analysis of amino acids and other primary amines in soils. *Soil Biology and Biochemistry*, v. 57, p. 78.

In Preparation or Review

Ladd, M.P., Hettich, R.L. (*in review*) Evaluation of an untargeted nano-liquid chromatography, dual-polarity, tandem mass spectrometry approach to expand coverage of low molecular weight dissolved organic matter in Arctic soils. *Environmental Science & Technology*.

Campa, M. F., Techtmann, S., **Ladd, M. P.**, Yan, J., Patterson, M., Garcia de Matos Amaral, A., Carter, K. E., Ulrich, N., Grant, C., Hettich, R. L., Lamendella, R., Hazen, T. (*in prep*) The impacts of the biocide 2-2-dibromo-3-nitrilopropionamide in microbial community structure and degradation potential in streams impacted by hydraulic fracturing activity. *Environmental Science & Technology*.

Ladd, M.P., Poudel, S., Reeves, D., Iversen, C. M., Wulschleger, S. D., Hettich, R. L. (*in prep*) Digging deeper: High-resolution mass spectrometry-based exometabolomics reveals biogeochemical hotspots with depth and by vegetation type in Alaskan Arctic soils. *Soil Biology & Biochemistry*.

Thesis

Ladd, M.P., Griffith, W. P. (2011) Sequence characterization of otter hemoglobin using a combination of bottom-up approach mass spectrometry and x-ray crystallography. University of Toledo Honors College, 95 p.

Other

Ladd, M.P., Wulschleger, S.D. (2015) Challenges and Opportunities of Interdisciplinary Teamwork for Early Career Arctic Scientists. Arctic Research Consortium of the United States (ARCUS) Witness the Arctic. Fall Issue 3.

SELECTED CONFERENCE PROCEEDINGS

Ladd, M.P., Iversen, C.M., Wulschleger, S.D., Hettich, R.L. (2018) Digging deeper: Exometabolomics reveals biogeochemical hotspots with depth and by vegetation type in Arctic tundra soils. American Chemical Society's Glass City Chemistry Conference, Toledo, OH (**invited**).

Ladd, M.P., Wulschleger, S.D., Hettich, R.L. (2017) Development and evaluation of a nontargeted metabolomics approach to identify biogeochemical hotspots in Arctic soils. Southeast Regional Meeting of the American Chemical Society, SERMACS, Charlotte, NC (**invited**).

Ladd, M.P., Iversen, C.M., Wulschleger, S.D., Campagna, S.R., Hettich, R.L. (2017) Non-targeted characterization of low molecular weight organic matter along Alaskan soil depth profile using RP and HILIC coupled with nano-ESI-HRMS/MS. American Society for Mass Spectrometry (ASMS) Annual Meeting, Indianapolis, IN.

Orr, F.L., **Ladd, M.P.**, Beegle, J., Callao, D., Mallow, A., Bodenheimer, A. (2016) Panel: Entrepreneurship and Graduate Education to Drive Innovation. SE Regional Energy Innovation Meeting, Chattanooga, TN (**invited**).

Ladd, M.P., Wulschleger, S.D., Hettich, R. (2016) Characterizing low molecular weight organic matter in Arctic polygonal tundra soils to identify biogeochemical hotspots using a dual-separation high-resolution mass spectrometry approach. American Geophysical Union (AGU), San Francisco, CA.

Ladd, M.P., Wulschleger, S.D., Hettich, R. (2016) Development and evaluation of a dual-separation, high-resolution, nano-ESI-LC-MS/MS approach for dissolved soil organic matter characterization. ASMS, San Antonio, TX.

Ladd, M.P., Abraham, P., Gianonne, R., Norby, R.; Hettich, R. (2015) Characterizing low molecular weight organic compounds in nitrogen-limited Arctic soils using nano-electrospray mass spectrometry. ASMS St. Louis, MO.

Ladd, M.P., Varmus, H., Schmidt, B.P., McNutt, M. (2015) Panel discussion: Communication Overkill? Lindau Nobel Laureate Meeting. Lindau, Germany (**invited**).

Graham, D., Chowdhury, T. R., Herndon, E., **Ladd, M.P.**, Elias, D., Phelps, T., Gu, B., Liang, L., Wulschleger, S. (2014) Biogeochemical controls on microbial CO₂ and CH₄ production in polygonal soils from the Barrow Environmental Observatory. Department of Energy TES/SBR PI Meeting, Potomac, MD.

Ladd, M.P., Long, H., Phelps, T., Graham, D. (2013) Simulating Arctic permafrost seasonal thaw conditions in the laboratory. Oak Ridge National Lab Women in Science Symposium, Oak Ridge, TN.

Ladd, M.P., Rinkes, Z., Weintraub, M.N. (2012) Effects of elevated N on the interaction between microbial activity and litter chemistry during decomposition of *Acer saccharum* litter. 97th Ecological Society of America (ESA), Portland, OR.

Ladd, M.P., Guo, J., Griffith, W.P. (2011) Sequence characterization of otter hemoglobin using a combination of mass spectrometry and x-ray crystallography. ACS Annual Meeting, Los Angeles, CA.

Crowe, J., **Ladd, M.**, McCann, S., Mull, D., Casarotto, V., Lind, C., Sucheck, S. (2008) To nuke or not to nuke: The joys and pitfalls of microwaves. Central Regional Meeting of the American Chemical Society (CERMACS).

FELLOWSHIPS & GRANTS

2018: Travel Grant, Oak Ridge Associated Universities (\$1,500)

2017: Travel Grant, Joint Institute for Biological Sciences (\$2,200)

2016: Travel Grant, American Society of Mass Spectrometry Graduate Student Travel Award (\$300)

2015: Travel Grant, University of Tennessee Graduate Student Travel Award (\$520)

2014: **Fellowship**, National Science Foundation (NSF) Graduate Research Fellowship (GRFP) (\$138,000)

2013: **Fellowship**, Energy Science & Engineering, Bredesen Center, University of Tennessee (\$50,000)

2011: Travel Grant, University of Toledo, Honors Undergraduate Chemistry Travel Award (\$500)

2010: **Fellowship**, Sullivan Honors Fellowship, University of Toledo Honors College (\$3,000)

2009: Scholarship, Chemical and Allied Industries of Northwest Ohio Scholarship (\$1,000)

LEADERSHIP EXPERIENCE

2014-2018: **Founder** & chair of *Pipeline: Vols for Women in STEM*, an organization with over 75 members & an annual budget of over \$10K; designed & organized an annual symposium with invited keynotes & over 100 oral and poster presentations to enhance representation of women and minorities in STEM fields at the University of Tennessee (<http://pipelineutk.org>)

2014-2016: **Lecturer**, designed and led 5-week course for graduate students on writing and publishing in science with an emphasis on incorporating storytelling and other modern and innovative techniques for more effective communication, University of Tennessee

2013-2016: **Secretary** – American Chemical Society, East Tennessee Local Section

2015: **Co-founder** of the *Forum on Science Ethics and Policy (FOSEP)*, an organization of graduate students interested in pursuing a career at the interface of science and policy; hosted weekly discussions about scientific evidence that impacts current political issues

2014-2015: **Representative** – Graduate Student Senate, University of Tennessee

2011-2013: **Mentor** to five undergraduate students in chemistry, chemical engineering, and ecology

2010-2013: **President, Vice President** – University of Toledo American Chemical Society Student Affiliates

PROFESSIONAL EXPERIENCE & SERVICE

2018: **Science adviser and opposition researcher**, Campaign for U.S. House Representative TN-District 2 Seat, provided briefs and developed talking points on scientific issues and opposition candidates

2016: **Peer reviewer**, *Ideas in Ecology and Evolution, Futures: Journal of Policy, Planning, & Futures Studies*

2015: **Policy intern for the Woodrow Wilson International Center for Scholars**, 8 weeks, Washington, D.C. *Arctic science policy recommendations and implications*, Independent Research Project with the Science and Technology Innovation Program, **Supervisors**: Dr. Todd Kuiken and David Rejeski

2015: **PLEN seminar participant**, *developed skills in leadership, diplomacy, and crowd-funding campaigns*

2014: **Review panel member**, University of Tennessee Graduate Student Senate travel awards committee

SELECTED AWARDS & HONORS

2018: University of Toledo Edward H. Schmidt Outstanding Young Alum Award

2017-2018: Bredesen Center Outreach Award, for informing & engaging the local community on scientific topics

2015-2017: AAAS/Science Program for Excellence in Science recipient

2015: American Delegate to the 65th Lindau Nobel Laureate Meeting in Germany, Interdisciplinary

2014: University of Tennessee Chancellor's Award for Extraordinary Professional Promise

2011: American Chemical Society (ACS) Undergraduate Analytical Chemistry Award

2009-2010: Arthur H. Black Analytical Chemistry Award, University of Toledo

2006-2010: NCAA Division I Athletic Scholarship, University of Toledo, Volleyball

PROFESSIONAL TRAINING

- 2017: Advanced **Metabolomics** Short-Course, American Society for Mass Spectrometry (ASMS)
Women in **Global Policy** Workshop, Public Leadership Education Network (PLEN)
Catalyzing **Advocacy in Science & Engineering** (AAAS CASE) Workshop
- 2016: **Responsible Conduct in Research** Training, University of Tennessee
Alan Alda Workshop on **Science Communication**, Oak Ridge National Laboratory
- 2015: **Writing Science** Workshop, University of Tennessee
- 2011: Arctic **Field Safety Training** Course, NSF Polar Services

SCIENCE COMMUNICATION & MEDIA FEATURES

- 2013-present: Research Website – www.malloryladd.com, Science Blog – *Think Like a Postdoc*
- 01/16/2018: Contributor to Daily Beacon Column – “Ask a Scientist: How do spiders handle the winter weather?”, <http://www.utdailybeacon.com/opinion/columns/ask-a-scientist-how-do-spiders-handle-the-winter-weather/article.html>
- 08/30/2017: Department of Energy ORNL feature – “Mallory Ladd: A molecular-scale Arctic expedition”, <https://www.ornl.gov/blog/eesd-review/mallory-ladd-molecular-scale-arctic-expedition>
- 04/12/2017: 500 Women Scientists Feature – Pod of the Week – Knoxville
<https://500womenscientists.org/updates/2017/4/12/knoxville-pod-of-the-week>
- 05/23/2016: Speaker at [Pint of Science](http://www.pintofscience.org) Knoxville – “Counting on Chemistry for Climate Change”
- 08/04/2015: UTK Office of Research – “Student serves on panel with Nobel Winners at Prestigious Conference”, <http://research.utk.edu/student-serves-on-panel-with-nobel-winners-at-prestigious-conference/>
- 06/27/2015: Contributor to 65th Interdisciplinary Lindau Nobel Laureate Meeting Blog Series – “Interdisciplinarity – More Than a Buzzword”, <http://www.lindau-nobel.org/interdisciplinarity-more-than-a-buzzword/>
- 05/09/2015: The Ledger, “Convincing Girls, Women to pursue science and math careers”, <http://www.memphisdailynews.com/news/2015/may/9/convincing-girls-women-to-pursue-science-math-careers/>
- 05/04/2015: Oak Ridge Associated Universities, “Top graduate students from U.S. convene with Nobel Laureates in Lindau, Germany”, <http://orau.org/media-center/news-releases/2015/fy15-30-top-graduate-students-meet-nobel-laureates-in-lindau-germany.aspx>
- 04/15/2015: Knoxville News Sentinel, “Graduate students create first UT women in STEM research symposium”, <http://knoxnews.com/news/local/graduate-students-create-first-ut-women-in-stem-symposium-ep-1039055111-362323401.html>
- 05/12/2014: Tennessee Today, “Five Students Win NSF Graduate Research Fellowship”, <http://tntoday.utk.edu/2014/05/12/students-win-nsf-graduate-research-fellowships/>

COMMUNITY OUTREACH

- 2018: Networking Director, 500 Women Scientists, hosted event with CienciaPR to raise funds for Puerto Rican scientists affected by the hurricanes; Moderator, National Science Bowl, Grades 6-8
- 2017: Speaker Coordinator for Knoxville’s taste of science festival, <http://tasteofscience.org>
- 2017: Gave lecture on climate change to Oak Ridge Institute for Continued Learning class (ages 55+)
- 2016: Science Judge, National Science Bowl, Grades 9-12, Oak Ridge, TN
- 2015: Volunteer for *Ask a Scientist* student organization at the University of Tennessee
- 2014: Volunteer for “Science Saturdays” sponsored by Oak Ridge National Laboratory to help engage middle school and high school students in hands-on STEM activities
- 2013: Helped Boy Scouts of America obtain chemistry merit badges at Camp Miakonda in Toledo, OH
- 2012: Group leader for the “Women in Science Day of Meetings” (WISDOM) at the University of Toledo
- 2011: Served on Student Affiliates of the American Chemical Society (StACS) committee to establish pre-professional STEM summer camp for high school students
- 2007-2015: Tutor for high school and college level math, science, and Spanish

PROFESSIONAL AFFILIATIONS

American Chemical Society (ACS)

Association for Women in Science (AWIS)

American Society for Mass Spectrometry (ASMS)

American Geophysical Union (AGU)

American Association for the Advancement of Science (AAAS)

Alpha Chi Sigma Professional Chemistry Fraternity (AXΣ)