

Relena Rose Ribbons

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Education

Ph.D. Geosciences & Natural Resource Management, University of Copenhagen	2017
Ph.D. Forest Ecology, Geosciences, & Natural Resource Mgmt, Bangor University	2017
Dissertation topic: Seeing the forest for the trees: Tree species effects on soil microbial communities and nutrient cycling dynamics.	
M.Sc. Forest Ecology, University of Massachusetts Amherst	2011
B.A. Environmental Studies, minors: Biology & Geology, Wellesley College	2009

Teaching experience

2019-2021	Assistant Professor at Lawrence University, Geosciences Department
2016-2019	Visiting Assistant Professor at Lawrence University, Biology Department
2009-2011	Teaching Assistant UMass-Amherst

Courses Taught

Lawrence University

Geology/Environmental Studies 265 (Biogeochemistry), Biology 130 (Introductory Cellular and Molecular Biology), Biology 235 (Evolutionary Biology), Freshman Studies 100 and 101, ENST 150 (Introduction to Environmental Science), & ENST 650 (STELLA models)

UMass-Amherst

Courses taught: Dendrology (Field and lab instructor), Forests and People

Appointments

2016-2021	Lawrence University (Appleton, Wisconsin)
2014-2017	Research Staff University of Copenhagen (Copenhagen, Denmark)
2014-2017	Research Staff Bangor University (Bangor, United Kingdom)
2013	Research Assistant (Harvard Forest, Massachusetts)
Research assistant on a long-term soil warming project with the Marine Biological Laboratory, and the HF-Hemlock Removal Experiment.	
2013	Research Assistant (Charles Darwin University, Australia)
Research focus on land owner surveys on ecosystem services	
2013	Research and Teaching Staff (Charles Darwin University, Australia)
Focus on ecology and management of tropical forests and savannas	
2012-2013	CSIRO Research Fellow and Research Programs Officer (TERC, AUS)
Research focus on ant communities along a precipitation gradient, and among savannas under experimentally altered fire regimes	
2011-2012	Energy Science and Engineering Fellow (UTK/ORNL, USA)
Educational focus on energy science and engineering and the environment	
2011	Research Assistant (UMass-Amherst)
Research focus on red spruce dendroclimatology and disturbance history	
2008-2009	Research Assistant (Harvard Forest, Massachusetts)
2005-2009	Earth Processes/Geosciences Research Assistant (Wellesley College)

Peer-Reviewed Publications

Del Toro, I. and **Ribbons R.R.** (2020) No Mow May lawns have higher pollinator richness and abundances: An engaged community provides floral resources for pollinators. *PeerJ*

Halbritter AH, De Boeck HJ, Eycott AE, et al. (2019) The handbook for standardized field and laboratory measurements in terrestrial climate change experiments and observational studies (ClimEx). *Methods in Ecology and Evolution*

Del Toro, I. and **Ribbons, R.R.** (2019) Variation in ant-mediated seed dispersal along elevation gradients. *PeerJ*

Del Toro, I., **Ribbons, R.R.**, Hayward, J., and Andersen, A. (2019) Are stacked species distribution models accurate at predicting multiple levels of diversity along a rainfall gradient? *Austral Ecology*

Ribbons, R.R., Kosawang, C., Ambus, P., McDonald, M.A., Grayston, S., Prescott, C.E., and Vesterdal, L. (2018) Broadleaf tree species effects on nitrogen cycling and soil microbial communities. *Biogeochemistry*

Weglarz, T., Holsen, L., **Ribbons, R.R.**, Hall, D. (2018) Microbial Diversity and Nitrogen-metabolizing Gene Abundance in Backyard Food Waste Composting Systems. *Journal of Applied Microbiology*

Del Toro, I., **Ribbons, R. R.**, Hayward, J. and Andersen, A. (2018) How accurate are Stacked Species Distribution Models at predicting multiple levels of diversity along a rainfall gradient? The curious case of Australian ants. *Austral Ecology*

Del Toro, I. Berberich, G., **Ribbons, R.R.**, Berberich, M., Sanders, N.J., and Ellison, A.M. (2017) Nests of Red wood ants (*Formica rufa*) are positively associated with tectonic fault zones: A double-blind test. *PeerJ*

Ribbons, R.R., Levy-Booth, D., Masse, J., Grayston, S.J., McDonald, M.A., Vesterdal, L., and Prescott, C.E. (2016) Linking microbial communities, functional genes and nitrogen-cycling processes in forest floors under four tree species. *Soil Biology and Biochemistry*

Martin, P., Jung, M., Brearley, F.Q., **Ribbons, R.R.**, Lines, E.R., and Jacob, A. (2016) Can we set a global threshold age to define mature forests? *PeerJ*

Del Toro, I., **Ribbons, R. R.**, and Ellison, A. M. (2015) Animal-mediated ecosystem functions on a warmer planet: an experimental evaluation of warming and ants on soil movement, decomposition, and nutrient cycling. *Journal of Animal Ecology*

Kendrick, J., **Ribbons, R.R.**, Classen, A.T., and Ellison, A.M. (2015) Changes in canopy structure and ant assemblages affect ecosystem processes following hemlock loss. *Ecosphere*

Andersen, A.N., **Ribbons, R.R.**, Petit, M., and Parr, C.L. (2014) Burning for biodiversity: highly resilient ant communities respond only to strongly contrasting fire regimes in Australia's seasonal tropics. *Journal of Applied Ecology*

Ribbons, R.R. (2014) Red spruce (*Picea rubens*) community dynamics at southern range margins: using dendrochronology to explore climate change. *PeerJ*

Stuble, K., Patterson, C., Rodriguez-Cabal, M., **Ribbons, R.R.**, Dunn, R.R., and Sanders, N.J. (2014) Ant-mediated seed dispersal mutualism very resilient to experimental climatic warming. *PeerJ*

Ribbons, R.R. (2014) Community responses to eastern hemlock loss across a latitudinal gradient. *Southeastern Naturalist* Special Issue 6

Del Toro, I., **Ribbons, R.R.**, and Pelini, S.L. (2012) The little things that run the world revisited: A review of ant-mediated ecosystem services and disservices. *Myrmecological News*

In Peer-Review

Ribbons, R.R., Del Toro, I., Smith, A.R., Healey, J.R., Vesterdal, L., and McDonald, M.A. A serenade for the role of humble roots: experimentally testing tree species effects on rhizosphere soil microbial communities.

Book Chapters and Educational Publications

Ribbons, R.R., McDonald, M.A., and Vesterdal, L. (2017) "Microbial communities, functional genes, and nitrogen cycling processes as affected by tree species" in *Soil biological communities and ecosystem resilience*. Ed. M. Lukac, P. Grenni, and M. Gamboni.

Ribbons, R.R. (2013) "Appalachian Mixed Mesophytic Forests ", "New England Acadian Forests", "The Allegheny Highland Forests" in *Biomes and Ecosystems: An Encyclopedia* Ed. R.W. Howarth

Contributions to Funding Agency Reports

Grissino-Mayer, H. D., Ababneh, L., Bohnert, D.J., Carroll, A.L., Cochran, W., de Graauw, K., Dolanc, C.R., Edwards, S.M., Karanitsch-Ackerl, S., Konchalski, C., Lawley, E., Pucko, C., **Ribbons, R.R.**, Rosene, D., Sink, S., and St Jacques, J. (2010) Temporal stability of the climate response in bristlecone pine (*Pinus longaeva* D.K. Bailey) during the 20th century. NADEF Final Report to NSF.

Selected Grants and Awards

2019 Wisconsin Space Grant Consortium Research Infrastructure Grant

2018 Mellon Pedagogy Grant

2017 University of Michigan Biological Station Summer Research Fellowship

2016 Bangor University SENRGY Research Grant

2013 FONASO: Forests and Nature for Society (University of Copenhagen and Bangor University) 3-year fellowship for Erasmus Mundus Joint Doctorate

2012 CSIRO Research Fellow (Tropical Ecosystems Research Centre, Darwin Aust.)

2011- CIRE Energy Science and Engineering Fellowship at the University of Tennessee-Knoxville (UTK) and Oak Ridge National Lab (ORNL)
Fellowship from Program for Excellence & Equity in Research *Awarded not accepted
University of Tennessee Graduate School Travel Fellowship for AGU meeting
McIntire-Stennis Research Grant for red spruce research
University of Massachusetts-Amherst, Teaching Assistant Honors
2010- National Science Foundation, GRFP, Honorable Mention
University of Massachusetts-Amherst Travel Grant for NADEF workshop
2007- Sarah Langer Award for Excellence in Geosciences at Wellesley College

Selected recent professional oral presentations

2021

Microbial communities in hydroponic gardens. WSGC Milwaukee, WI, USA

2017

Seeing the forest for the trees. Lecture Lawrence University, WI USA

2016

Tree species effects on nitrogen dynamics. British Ecological Society PSE, London
Four coniferous tree species effects on soil nutrient cycling. Umea University, SE
Forest soil nutrient cycling and functional genes. University of Copenhagen, DK

2015

Nutrient cycling and functional genes in four tree species. Rome, IT
Ecosystem services provided by ants. University of Copenhagen, DK
Microbial communities, functional genetics, & forest nitrogen cycling. Göttingen, GE
Ant mediated ecosystem services. Royal Entomology Society (Invited Keynote speaker), Dublin, IR
Tree-soil interactions and effects on nutrient dynamics. Bangor, UK

2014

Tree species effects on nutrient cycling. University of Copenhagen, DK
Mini-forests in the Rhizotron. Plant Soils Ecosystems PEPG, Manchester, UK
Determining tree species effects on nutrient cycling with ¹⁵N. UBC, CAN
Forests and soils: single species effects on soils. TERC. Darwin, AUS
Mixed species tree & soil effects in a Rhizotron. University of Manchester, UK
Tree species effects on nutrient cycling. Bangor, UK

2013

Savanna ant community responses to fire. CSIRO TERC. Darwin, AUS
FONASO (Forests and Nature for Society). University of Copenhagen, DK
Tree species & soils interactions. CSIRO TERC. Darwin, AUS

2012

Ecosystem services mediated by ants. CSIRO TERC. Darwin, AUS
Aphaenophest Meeting. Petersham, MA, USA
CIRE Program Spring Retreat. Oak Ridge, TN, USA

Professional workshops

2021

Midstates Consortium for Math and Science Early Career Workshop. Virtual

2019

Earth Science Educators Rendezvous. National Association of Geoscience Teachers. Nashville, TN, USA

Sustainability Across the Curriculum. Association for the Advancement of Sustainability in Higher Education. Carlisle, PA, USA

2016

Nutrient cycling in arctic and boreal ecosystems. Umea University, SE

Valuing Nature Business Impact School. NERC London, UK

Genetics and ecology at the Institute for Geosciences. University of Copenhagen, DK

2015

Soil Biological Communities and Aboveground Resilience. COST Action FP1305

BioLink on Linking belowground biodiversity and ecosystem function in European Forests. Rome, IT.

2014

British Ecological Society- Ecological Ambassadors Outreach Training. London, UK

Early Researcher Development Program. Bangor, UK

Systematic Reviews and Meta-Analysis Workshop, Centre for Evidence Based Ecology and Collaboration for Environmental Evidence, Bangor, UK

2012

Econnect Media Skills Workshop. CSIRO Tropical Ecosystems Research Centre (TERC), Darwin, Australia

National Institute for Mathematical and Biological Synthesis workshop

“Integration of disturbance ecology and biogeochemistry to predict future dynamics of terrestrial carbon cycle under global change” Knoxville, USA

2010

Women’s Institute for Leadership Development (WILD) Hampshire College, Amherst, Massachusetts, USA

North American Dendroecological FieldWeek (NADEF) White Mountains Research Station, California, USA

Service and Outreach

Manuscript reviewer: Soil Biology and Biochemistry, Biological Invasions, Forest Ecology and Management, Global Change Biology, Catena, Plant and Soil Science, Applied Surface Science, Sustainability, Forests

Mentoring

Lawrence University Mentored Undergraduate Students:

Sophia Driessen (2019-present), Gillian Buckhart (2019-2021), Katie Mahorney (2021), Ella Lemley-Fry (2021), Catherine Wagoner (2020-2022), Erin Szablewski (2018- 2021), Floreal Crubaugh (2018-2020), Daniela Villagomez (2019-2020), Liam Wulfman (2019-2020), Ora Raymond (2019-2020), Cady Greenslit (2017-2018), Maggie Andersen (2017-2019), Lindsay Holsen (2016-2018), Jason Duncan (2018), Bronwyn Earthman (2018) and BIO 130 Research students (2016-2019).

Mentored Undergraduates at other Institutions:

Sam Butler (2017, UMBS REU), Robert Poole (2015-2016, Bangor, UK), Albert Wu (2014, UBC-Vancouver), Yvan Delgado (2012 HF REU Program), Kelsey Richesin (2011-2012 UT-Knoxville), and Nathan Kielb (2011 UMass-Amherst).

2015 ESA SEEDS Meeting Mentor

2012-2013 Ants Group Organizer and Moderator (TERC, Australia)

2011 Harvard Forest REU Summer Program Coordinator

Responsible for 31 undergraduate students, planning and implementing bi-weekly seminars, ethics lunches, outdoor activities, research guidance, chemical safety and emergency information for labs at Harvard Forest, and coordinating end of summer research symposium.

Selected Press and Media

Lawrence University Summer Research June 2021

Environmental Science major launched at Lawrence University April 2021

Hydroponics research with students in D-term December 2020

Life Underneath Our Feet in Northeast Wisconsin Land Trust Spring 2020

Ultrarunning Faculty at Lawrence University August 2019

Rhizotron research update in Friends of Treborth Botanic Gardens May 2015

Rhizotron research featured in Friends of Treborth Botanic Gardens Newsletter 2014

Researcher Profile featured in CSIRO Achievements Report 2013

Savanna research from Darwin Lab featured in CSIRO Achievements Report

Australian research featured in Myrmecia, Australian Entomological Society

Red spruce research featured in the UMass Extension Service News Bulletin

The Harvard Forest REU program featured in the Harvard Crimson

Published Abstracts

Ribbons, R.R. (2021) Microbial communities in hydroponic gardens. Wisconsin Space Grant Consortium. Milwaukee, WI, USA. Talk

Ribbons, R.R., McDonald, M., Vesterdal, L., Grayston, S., and Prescott, C. (2019) Context-dependent tree species effects on soil nitrogen transformations and related microbial functional genes. International Biogeography Society Congress Málaga, Spain. Poster

Del Toro, I., Shimabukuro, L., and Ribbons, R.R. (2019) Implementing “half-earth” framework, influences protected ranges in marine and terrestrial ecosystems: A case study with the USA and IUCN. International Biogeography Society Congress Málaga, Spain. Poster

Vesterdal, L., Peng, Y., Steffens, C., Schelfhout, S., De Schrijver, A., Ribbons, R., and Prescott, C.E. (2018) Tree species effects on stocks and vertical distribution of soil carbon: Links to mycorrhizal association, microbial characteristics and soil fauna communities. European Geophysical Union, Vienna, Austria.

Christiansen, J., Eberling, B., Ribbons, R., Hedø, J., Fernandez Alonso, M. J., Krych, L., Nielsen, D.S., and Kitzler, B. (2016) N₂O and N₂ emissions from contrasting soil environments- interactive effects of soil nitrogen, hydrology, and microbial communities. European Geophysical Union, Vienna, Austria.

Ribbons, R.R. (2016) Tree species effects on forest floor nutrient cycling and soil microbes. British Ecological Society Plants-Soils-Ecosystems meeting. London, UK. Talk

Ribbons, R.R. (2016) Tree species effects on nutrient cycling and soils at a common garden experiment. Nutrient cycling workshop. Umea, SE. Talk

Ribbons, R.R. (2016) Tree species effects on nutrient cycling and under four forest floors in a common garden experiment. Genetics and Ecology workshop. Copenhagen, DK. Talk

Ribbons, R.R. (2015) Nutrient cycling and functional genetics under four tree species. Soil Biological Communities and Aboveground Resilience. COST Action FP1305 BioLink on Linking belowground biodiversity and ecosystem function in European Forests. Rome, IT. Invited talk

Ribbons, R.R. (2015) Tree species effects on nutrient cycling and soils at a common garden experiment. University of Copenhagen Ph.D. Conference. Copenhagen, DK. Poster

Ribbons, R.R. (2015) Tree species effects on nitrogen cycling processes and functional communities in soil at a common garden experiment. CAR-ES conference on Managing forests to promote ecosystem services. Copenhagen, DK. Poster

Ribbons, R.R. (2015) Microbial communities, functional genetics and nutrient cycling in forest floors under four tree species. 5th International Symposium on Soil Organic Matter. Göttingen, DE. Talk

Ribbons, R.R. and Del Toro, I. (2015) Girls who run the world from the ground up: ant-mediated ecosystem services and effects on nutrient cycling. Royal Entomological Society. Dublin, IR. Invited keynote speaker, with special commendation for presentation excellence.

Ribbons, R.R., Levy-Booth, D.J., Grayston, S.J., McDonald, M., Vesterdal, L. and Prescott, C.E. (2015) Tree species effects on nitrogen cycling processes and functional communities in soil at a common garden experiment. Ecological Society of America, Baltimore, MD. Talk

Ribbons, R.R. (2015) Tree influences on soil nutrient cycling. FONASO Conference. Bangor, UK. Talk

Ribbons, R.R., Levy-Booth, D.J., Grayston, S.J., and Prescott, C.E. (2015) Tree species effects on nitrogen cycling processes and functional communities in soil at a common garden experiment. Bangor University Postgraduate Symposium. Bangor, UK. Poster

Ribbons, R.R., Levy-Booth, D.J., Grayston, S.J., and Prescott, C.E. (2014) Tree species effects on nitrogen cycling processes and functional communities in soil at a common garden experiment. Global Soil Biodiversity Initiative conference. Dijon, FR. Poster

Ribbons, R.R., McDonald, M., Vesterdal, L., Smith, A., and Healey, J. (2014) Mini-forests in the Rhizotron: exploring single and mixed tree species effects on soil microbial communities and

carbon dynamics. Carbon cycling: from Plants to Ecosystems. British Ecological Society Plant-Soils-Ecosystems and Plant Environmental Physiology Group. Manchester, UK. Talk

Del Toro, I., Ribbons, R.R., and Andersen A.N. (2014) Biodiversity along rainfall gradient: insights into climate change impacts on Australia's ant biodiversity. Association for Tropical Biology and Conservation Meeting. Cairns, AUS. Talk

Ribbons, R.R. Tree species effects on nutrient cycling dynamics. (2014) Bangor University Postgraduate Symposium. Bangor, UK. Talk

Andersen, A.N., Ribbons, R.R., Petit, M, and Parr, C.L. (2014) Burning for Pyrodiversity. Kruger Network Meeting. Kruger, South Africa.

Del Toro, I., Ribbons, R.R., and Andersen A.N. (2013) Community assembly of ants along environmental gradients: Combining species distribution and macroecological models. International Biogeography Society Special Meeting. Montreal, CAN.

Ribbons, R.R. (2012) Forests and soils: interactions between tree species and nutrient cycling. Forests for Nature and Society meeting. Copenhagen, DK. Talk

Ribbons, R.R., Sanders, N.J., Ellison, A.M., and Classen, A.T. (2012) Community and ecosystem responses to experimental ant and forest manipulations. Harvard Forest Research Symposium. Petersham, MA. Poster

Ribbons, R.R., Sanders, N.J., Ellison, A.M., and Classen, A.T. (2012) Community and ecosystem responses to experimental ant and forest manipulations. Bulletin of the Ecological Society of America Meeting. Portland, OR. Poster

Ribbons, R.R., Kelty, M., Pederson, N., and Orwig, D. (2011) Red spruce (*Picea rubens*) community dynamics at southern range margins: using dendrochronology to explore climate change. American Geophysical Union Fall Meeting, San Francisco, CA. Poster

Del Toro, I. and Ribbons, R.R. (2010) Schoolyard Biology: K-12 outreach. Bulletin of the Ecological Society of America Meeting. Pittsburgh, PA. Poster

Ribbons, R.R. (2008) Hemlock Woolly Adelgid Influences on Eastern Hemlock Forests. Harvard Forest Summer Symposium. Petersham, MA. Talk

Ribbons, R.R. and Orwig, D. (2009) Long-term Vegetation Influences of Hemlock Woolly Adelgid. Bulletin of the Ecological Society of America Meeting. Albuquerque, NM. Poster

Ribbons, R.R. (2008) Wellesley Forest Community Characterization. Conference Proceedings of the Society of American Foresters Meeting. Reno, NV. Poster

Ribbons, R.R. (2008) Wellesley Forest Composition and Structure: Then and Now. Ruhlman Conference Proceedings. Wellesley, MA. Poster

Ribbons, R.R. (2007) Wellesley College Botanic Gardens: History of Oaks. Ruhlman Conference Proceedings. Wellesley, MA. Poster

Ribbons, R.R. (2006) Contaminated Lake Sediments in Revere Copper Mill Pond in Canton, MA. Ruhlman Conference Proceedings. Wellesley, MA. Poster