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| Relena Rose Del Toro Ribbons  Relena.r.ribbons@lawrence.edu • relenaribbons.weebly.com  Lawrence University, Biology Department, 711 E. Boldt Way, Appleton, WI 54911 U.S.A. |
| **Education**  Ph.D. Geosciences & Natural Resource Management, University of Copenhagen 2017  Ph.D. Forest Ecology, Geosciences, & Natural Resource Mgmnt, 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**  2016- Present- Visiting Professor at Lawrence University  Courses taught: Biology 130 (Introductory cellular and molecular biology),  Biology 235 (Evolutionary biology), Freshman Studies 100, Freshman Studies 101, and Environmental Studies senior capstone 650 (STELLA modeling)  2017 Guest lecturer at University of Michigan Biology Station  Topics include: Ecosystem Ecology, Forest Ecology  2014- 2016- Guest lecturer at Bangor University, and the University of Copenhagen  Topics include: Biogeochemistry, Isotopic Nutrient Cycling Studies, Snowdonia  2010- 2012- Guest lecturer UMass-Amherst, and Smith College  Topics include: Dendroclimatology, Forest Soil Ecology  2009-2011- Teaching Assistant UMass-Amherst  Courses taught: Dendrology (field and lab instructor), Forests and People  **Appointments**  2016- Present 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  2009- 2010 Dendrology Class and Lab Teaching Assistant (UMass-Amherst)  2010 Forests and People Teaching Assistant (UMass-Amherst)  2008-2009 Research Assistant (Harvard Forest, Massachusetts)  2008 Earth Processes and Geosciences Teaching Assistant (Wellesley College)  2005-2009 Brabander Geosciences Lab Research Assistant (Wellesley College)  **Peer-Reviewed Publications**  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) Community responses to eastern hemlock loss across a latitudinal gradient. *Southeastern Naturalist* Special Issue 6  **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.*  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.  **Ribbons, R.R.,** Kosawang, C., Ambus, P., McDonald, M.A., Grayston, S., Prescott, C.E., and Vesterdal, L. Broadleaf tree species effects on nitrogen cycling and soil microbial communities.  Del Toro, I., **Ribbons, R. R**., Hayward, J. and Andersen, A. How accurate are Stacked Species Distribution Models at predicting multiple levels of diversity along a rainfall gradient? The curious case of Australian ants.  Del Toro, I., **Ribbons, R. R**., Rodriguez, C. and Mackay, W. Variation in ant-mediated seed dispersal along elevation gradients.  *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**  *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  Louise Coker Fellowship for Biology \*Awarded not accepted  *2012*  CSIRO Research Fellow (Tropical Ecosystems Research Centre, Darwin, Australia)  *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 |
| **Professional oral presentations**  *2017*  Seeing the forest for the trees. Lawrence University, WI USA  *2016*  Miniforests in the Rhizotron. RABLS Lecture Lawrence University, WI, USA  An introduction to the15N pool dilution method. Guest lecture Copenhagen, DK  Tree species effects on nitrogen dynamics. BES PSE, London, UK  Four coniferous tree species effects on soil nutrient cycling. Umea University, SE  Forest soil nutrient cycling and functional genes. University of Copenhagen, DK  *2015*  Ant-mediated ecosystem services. Guest lecture Copenhagen, DK  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. Gottingen, GE  Ant mediated ecosystem services. RES (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. PSE PEPG Meeting, 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 Conservation Biology Guest Lecturer. UMass. Amherst, MA, USA CIRE Program Spring Retreat. Oak Ridge, TN, USA  *2011*  Graduate Student Wilderness Society Gathering. Knoxville, TN USA Harvard Forest REU Summer Seminar. Petersham, MA, USA  *2010*  Ecology course guest lecturer, Smith College. Northampton, MA, USA Dendroclimatology of Bristlecone Pine. NADEF, Bishop, CA, USA  Introduction to dendrochronology guest lecturer. UMass Amherst, MA, USA  *2008 and 2009*  Harvard Forest Graduate Student Gathering. Petersham, MA, USA  Harvard Forest Summer Symposium. Petersham, MA, USA |
| **Professional workshops**  *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  Professional Societies: Ecological Society of America (ESA), SEEDS Network for Alumni and Professionals (SNAP)  2015-2017 BES Plant-Soils-Ecosystems Student Representative  2015-2016 FONASO Commission Student Representative  2014-2016 BES Ecological Ambassador, Bangor, UK  2012-2013 Scientists in School Program in Darwin, Australia  2011-2012 Graduate Student Panel, Harvard Forest REU Program  2011-2012 Darwin Day Committee at the University of Tennessee-Knoxville  2009-2011 Environmental Conservation Graduate Student Council (UMass)  2009-2014 Harvard Forest tour guide; Schoolyard Biology LTER assistant  2008-2009 Harvard Forest REU Summer Program Evaluation Research Assistant  2005 Girl Scout Gold Award for Natural History and Bicycling programs  2003-2005 International Envirothon forestry, soils, wildlife, aquatics honors |
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| **Mentoring**  Mentored Undergraduate Students: Lindsay Holsen (2016-present, Lawrence), Sam Butler (2017, UMBS REU), BIO 130 Research students (2016-present, Appleton, WI), Robert Poole (2015-2016, Bangor, UK), Albert Wu (2014, UBC-Vancouver), Yvan Delgado (2012 HF REU Program), Kelsey Richesin (2011-2012 UT-Knoxville), 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 the end of summer research symposium |
| **Press Releases and Related Articles** (with links)  [Rhizotron research update in Friends of Treborth Botanic Gardens May 2015](file:///C:\Users\qbd188\Dropbox\personal.misc\CV\Newsletter.%20http:\www.treborthbotanicgarden.org\newsletters\NL_May_15.pdf)  [Rhizotron research featured in Friends of Treborth Botanic Gardens Newsletter 2014](http://www.treborthbotanicgarden.org/newsletters/NL_Sept_14.pdf)  [Researcher Profile featured in CSIRO Achievements Report 2013](http://www.csiro.au/Organisation-Structure/Divisions/Ecosystem-Sciences/Darwin-2013-Achievements-Report.aspx)  [Savanna research from Darwin Lab featured in CSIRO Achievements Report](file:///C:\Users\qbd188\Dropbox\personal.misc\CV\2012-%20http:\www.csiro.au\Organisation-Structure\Divisions\Ecosystem-Sciences\Darwin-2012-Achievements-Report.aspx)  [Australian research featured in Myrmecia, Australian Entomological Society](http://onlinelibrary.wiley.com/doi/10.1111/aen.12022/pdf)  [Red spruce research featured in the UMass Extension Service News Bulletin](http://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/interest-areas/CFA_Climate_2011.pdf)  [The Harvard Forest REU program featured in the Harvard Crimson](http://www.thecrimson.com/article/2010/12/6/students-forest-harvard-program/?page=1) |

**Published Abstracts**

Christiansen, J., Eberling, B., Ribbons, R., Hedo, 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. Poster

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. Nutreint 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. Gottingen, 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 meeting. 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. Talk

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. Talk

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

Edwards,M., Ababneh,L., Grissino-Mayer,H., Ribbons,R.R., and the 2010 NADEF Climate Group. (2010) Dendroclimatology of Bristlecone Pine (*Pinus longaeva*) during the 20th Century. 65th Annual Meeting, Southeastern Division of the Association of American Geographers. Birmingham, AL. 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

**References**

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