

Matthew K. Lau

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Education

- Ph.D. Biology, [Northern Arizona University](#), [IGERT Fellow](#), 2009–2014
 - *Title*: The evolution of ecological networks.
 - *Advisor*: [Thomas G. Whitham](#)
- M.S. Biology, [Northern Arizona University](#), 2008
 - *Thesis*: Host species and site contribute to variation in foliar endophyte abundance, diversity and community composition.
 - *Advisor*: [Nancy C. Johnson](#)
- B.S. Biology, [Humboldt State University](#), 2004
 - *Emphasis*: Fungal Ecology
 - *Advisors*: Nathan J. Sanders and Terry W. Henkel
 - *Advanced Study*: [Harvard Forest REU](#), Summer 2003, [Aaron M. Ellison](#)

Awards and Fellowships

- ARCS Foundation Scholarship (Phoenix Chapter), 2013–2014
- Chateaubriand Fellowship (French Embassy), 2011–2012
- NSF IGERT Fellowship (Northern Arizona University), 2008–2010
- ARCS Foundation Scholarship (Phoenix Chapter), 2007–2008
- ARCS Foundation Scholarship (Phoenix Chapter), 2006–2007
- Northern Arizona University Minority Student Development Fellowship, 2005–2008

Computer Software and Language Proficiencies

Computer: R, Python, Matlab, LaTeX, HTML, Bash, Emacs, git, MacOS, Linux/Unix and Windows

Human: English (native speaker), French (not fluent), Mandarin (not fluent) and Spanish (not fluent)

Research Experience

- Visiting Researcher, [Community Genetics Laboratory](#) ([Richard Michalet](#)), Fall 2011
- Visiting Researcher, [Systems Ecology and Ecoinformatics Lab](#) ([Stuart Borrett](#)), Summer 2011
- Research Assistant, [Cottonwood Ecology Group](#) ([Dr. Thomas G. Whitham](#)), 2010–2011
- Research Assistant, [The Soil Ecology Lab](#) ([Dr. Nancy C. Johnson](#)), 2005–2008
- Research Assistant, Humboldt State University Ant Ecology Lab ([Dr. Nathan J. Sanders](#)), 2003

Teaching Experience

- Seminar on Ethics in Computational Ecology (Harvard Forest, Harvard University), Summer 2014
- BIO326L Ecology Lab (Northern Arizona University), Fall 2012–Spring 2013
- [Introduction to Programming in R \(University of North Carolina Wilmington\)](#), Summer 2011
- BIO181 Introductory Biology: The Unity of Life (Northern Arizona University), Fall 2010
- BIO680 [Introduction to Ecological Analyses in R](#) (Northern Arizona University), Fall 2008 and Fall 2009

Contributed Software

Matthew K. Lau, Stuart R. Borrett and David E. Hines (2014) `enaR`: Tools for Ecological Network Analysis. R package version 2.7.

Matthew K. Lau and Raj Whitlock (2009) `DiversitySampler`: Functions for re-sampling a community matrix to compute diversity indices at different sampling levels.. R package version 2.0.

Matthew K. Lau (2009) `DTK`: Dunnett-Tukey-Kramer Pairwise Multiple Comparison Test Adjusted for Unequal Variances and Unequal Sample Sizes. R package version 3.0.

Publications

- Lau MK (2014) BOOK REVIEW: Grounding ecological networks. *Ecology*. 95:2681–2682.
- Flores-Rentería L, Lau MK, Lamit LJ, Gehring CA (2014) An elusive ectomycorrhizal fungus reveals itself: A new species of *Geopora* (Pyrenomataceae) associated with *Pinus edulis*. *Mycologia*. DOI 10.3852/13-263.
- Lamit LJ, Lau MK, Sthultz CM, Wooley SC, Whitham TG, & Gehring CA (2014) Tree genotype and genetically based growth traits structure twig endophyte communities. *American Journal of Botany*. DOI 10.3732/ajb.1400034.
- Ikeda DH, Bothwell HM, Lau MK, O'Neill G, Grady K, Ferrier SM, Allan G, Shuster SM & Whitham TG (2013) A genetics-based Universal Community Transfer Function for predicting the impacts of climate change on future communities. *Functional Ecology* 28:65–74.
- Lau MK, Arnold EA & Johnson NC (2013) Factors influencing communities of foliar fungal endophytes in riparian woody plants. *Fungal Ecology* 6: 365–378.
- Álvarez-Sánchez FJ, Johnson NC, Antoninka AJ, Chaudhary VB, Lau MK, Owen SM, Sánchez-Gallen I, Guadarrama P, & Castillo S (2012) Large-scale diversity patterns in spore communities of arbuscular mycorrhizal fungi. In M. Pagano, editor, *Mycorrhiza: Occurrence in Natural and Restored Environments*, Nova Science Publishers, New York (USA).
- Bowker MA, Muñoz A, Martinez T & Lau MK 2012 Rare drought-induced mortality of juniper is enhanced by edaphic stressors and influenced by stand density. *Journal of Arid Environments* 76:9–16.
- Lau MK, Whitham TG, Lamit LJ & Johnson NC (2010) Ecological & Evolutionary Interaction Network Exploration: Addressing the Complexity of Biological Interactions in Natural Systems with Community Genetics and Statistics. *JIFS* 7:17–25
- Price LB, Johnson KE, Aziz M, Lau MK, Bowers J, Ravel J, Keim PS, Serwadda D, Wawer MJ & Gray RH (2010) The effects of circumcision on the penis microbiome. *PLoS One* 5(1):e8422.
- Chaudhary VB, Lau MK & Johnson NC (2008) Macroecology of microbes – biogeography of the Glomeromycota. In V. Ajit, editor, *Mycorrhiza* (3rd Edition), Springer-Verlag, Germany.
- Ellison AM, Chen J, Diaz D, Kammerer-Burnham C & Lau M (2005) Changes in ant community structure and composition associated with hemlock decline in New England. Pages 280-289 in B. Onkenand and R. Reardon, editors. *Proceedings of the 3rd Symposium on Hemlock Woolly Adelgid in the Eastern United States*. U.S. Department of Agriculture – U.S. Forest Service – Forest Health Technology Enterprise Team, Morgantown, West Virginia.

In Progress

- Lau MK, Borrett SR, Keith AR, Shuster SM & Whitham TG (In Prep) Genotypic variation in foundation species generate ecological network structure.
- Butterfield BJ, Lau MK, Shutters S, (In Review Ecology Letters) Merging positive and negative interaction networks provides new insights into community assembly rules.
- Floate KD, Godbout J, Lau MK, Whitham TG, Isabel N (Submitted) Plant-herbivore interactions in a trispecific hybrid swarm of cottonwoods: Genetic similarity and the hybrid bridge hypothesis.
- Smith DS, Lamit LJ, Lau MK, Gehring CA & Whitham TG (In Review Ecological Entomology) Change of plant traits by introduced elk negatively affects associated arthropod communities and network structure.
- Borrett SR & Lau MK (Submitted) An open-source package for ecological network analysis in R.
- Stone AC, Gehring CA, Lau MK, Cobb NS & Whitham TG (In Prep) Plant mediated indirect effects on communities reduce diversity and Plant mediated indirect genetic effects of scale herbivory alter arthropod community networks on a foundation tree.

Presentations

- Lau MK, Borrett SR *enaR: Free, open-source tools for ecological network analysis*. Ecological Society of America Meeting (ESA), Minneapolis, MN, August 2013
- Lau MK, Lamit LJ, Gehring CA, and Whitham TG *Cottonwood genetics influence lichen interaction network structure*. Université Bordeaux 1, Talence, France, December 2011
- Whitham TG, Lau MK, Lamit LJ, Smith DS, Busby PE, Schweitzer JA, Gehring CA, Allan GJ, Shuster SM and Newcombe G * A Community Genetics Approach for Understanding Microbial Community Structure and Feedbacks on a Foundation Tree Species.* Ecological Society of America Meeting (ESA), Pittsburgh, PA, August 2010
- Lau MK, Keith AR and Whitham TG *Network structure is linked to the community stability of canopy arthropods associated with Populus angustifolia*. Ecological Society of America Meeting (ESA), Pittsburgh, PA, August 2010
- Lau MK, Johnson NC, Whitham TG, Hagenauer LE, Lamit LJ and Lonsdorf EV *A Community Genetics Approach for Understanding Complex Biological Interactions*. 7th International Symposium on Integrated Field Science, Tohoku University, Sendai, Japan, October 2009
- Lau MK, Hagenauer LE and Whitham TG *Assemblage-structuring force of species interactions varies spatially and temporally: Co-occurrence analysis of canopy arthropod distributions*. Ecological Society of America Meeting (ESA), Albuquerque, NM, August 2009
- Lau MK, Johnson NC *Fungal foliar endophyte communities exhibit host species fidelity in woody plants of Arizona riparian forests*. Ecological Society of America Meeting (ESA), Milwaukee, WI, August 2008
- Lau MK *Unusual absence of asymptomatic fungal leaf endophytes of Populus fremontii: a potential phytochemical mechanism*. (poster) Ecological Society of America Meeting (ESA), San Jose, CA, August 2007
- Whitewater L, Lau MK, Johnson NC *Investigating the potential for local adaptation of the arbuscular mycorrhizal fungus*. (poster) REU Summer Research Symposium, Northern Arizona University, Aug 2007.
- Lau MK, Johnson NC *Do AMF cultivate their favorite bacteria? A hypothesis for a potential mechanism of AMF adaptation*. (poster) 5th International Conference on Mycorrhiza (ICOM5), Granada, Spain, July 2006

Professional Activities

Article Reviewer

- *PLoS One*

- *Ecological Monographs*
- *Ecology*
- *Botany* (formerly *The Canadian Journal of Botany*)
- *Acta Oecologia*
- *Nature*

Professional Memberships

- [Society for Conservation Biology \(SCB\)](#), 2008–present
- [British Ecological Society \(BES\)](#), 2008
- [American Association for the Advancement of Science \(AAAS\)](#), 2008
- [Ecological Society of America \(ESA\)](#), 2005–present

Meeting and Workshop Organization

- Workshop Coordinator, EU Sponsored White Paper Workshop on Foundation Species Genetics Research Directions, Flagstaff, AZ Spring 2011
- Meeting Organizer, Western Mycorrhiza Gathering, Flagstaff, AZ, 2008
- Workshop Organizer, IGERT Workshop: Bayesian Statistics in Ecology, Flagstaff, AZ, 2007
- Meeting Organizer, Soil Ecology Society Conference, Moab, UT, 2007

Education and Outreach

- Research featured in PBS documentary, [One Thousand Invisible Cords](#)
- Secretary, CO Plateau Chapter of the Society for Conservation Biology, 2010–2012

Student Services

- President, Biology Graduate Student Association (Northern Arizona University), 2009–2011
- Email List Curator, Biology Graduate Student Association (Northern Arizona University), 2008
- Social Coordinator, Biology Graduate Student Association (Northern Arizona University), 2006

References

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