Matthew K. Lau

Postdoctoral Fellow
Harvard Forest
Harvard University
324 N. Main St.
Petersham, MA 01366

Office: (978) 756-6165
Email: matthewklau@fas.harvard.edu
Website: https://github.com/MKLau

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 Computional 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 Unversity), Fall 2010
- BIO680 Introduction to Ecological Analyses in R (Northern Arizona Unversity), 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 (Pyronemataceae) 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 andPlant 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*

- *PLoS Computational Biology*
- *Ecological Monographs*
- *Ecology*
- *Journal of 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

- Thomas G. Whitham
  Regents' Professor
  Northern Arizona University
  (928) 523-7215
  thomas.whitham@nau.edu
- Stuart R. Borrett
  Assistant Professor
  University of North Carolina Wilmington
  (910) 962-2411
  borretts@uncw.edu
- Matthew A. Bowker
  Assistant Professor
  Northern Arizona University
  (928) 523-9302
  matthew.bowker@nau.edu
- Stephen M. Shuster
  Professor of Zoology

Northern Arizona University
(928) 523-9302
stephen.shuster@nau.edu

- Nancy C. Johnson
  Professor of Biology
  Northern Arizona University
  (928) 523-6473
  nancy.johnson@nau.edu

- Aaron M. Ellison
  Senior Research Fellow
  Harvard Forest, Harvard University
  (978) 724-3302
  aellison@fas.harvard.edu