

ECOLOGIST II

NATIONAL ECOLOGICAL OBSERVATORY NETWORK

EDUCATION

<i>Indiana University Bloomington</i>	2017
Doctorate in Biology with Bioinformatics minor; GPA 4/4	
<i>University of Minnesota Duluth</i>	2011
Master of Science in Water Resources Science; GPA 3.9/4	
<i>Carleton College</i>	2008
Bachelor of Arts in Biology <i>magna cum laude</i> with distinction in major and senior thesis; GPA 3.6/4	

TECHNICAL SKILLS

Programming languages: Python, R, Shell scripting (bash), MATLAB, MySQL, Java
Operating systems: Mac OS, Linux (including high-performance computing), Windows
Software: Microsoft Office, Adobe Illustrator, SFTP clients, Docker, Pachyderm pipeline manager
Web development: HTML, CSS, JavaScript

WORK EXPERIENCE***National Ecological Observatory Network (NEON)***

Ecologist II | 2021-Present

Ecologist I | 2020-2021

- Promoted within 14 months for exceeding expectations and assuming increased responsibilities
- Managing data generation, quality control, and public availability for all NEON microbial sequencing data products (~\$400K/year project)
- Built bioinformatics analysis pipeline with Python and bash to re-process 250GB of sequencing data using Pachyderm pipeline manager for reproducibility with Docker containers and remote computing
- Collaboratively developing flexible R functions to quickly assess data quality and enable faster fixes
- Optimizing sample collections using data-driven approach to streamline sampling without losing information

Los Alamos National Laboratory

Post-doctoral researcher | 2017 – 2019

- Developed data analysis pipeline to download, manage, process, and analyze large volumes (terabytes) of fungal DNA sequencing data using Python, Bash, and R scripts with distributed computing
- Screened protein sequences from 1100 fungal genomes for diverse functional pathways
- Established laboratory space and protocols to identify fungal-associated bacteria with minimal supervision
- Maintained and adding bioinformatics tools to user-friendly analysis pipeline

Indiana University Bloomington

Graduate Research Assistant | 2012 – 2017

- Analyzed associations between site conditions in prairies across the Midwest and communities of arbuscular mycorrhizal (AM) fungi, a group that increases plant growth, using machine learning and multivariate statistical techniques in R
- Developed an R package that introduces a fast and novel principal components-based method to identify patterns of migration across a landscape using genetic data
- Led interdisciplinary collaboration to evaluate five DNA-based methods for delimiting AM fungal species
- Wrote a collection of Python scripts to streamline the simulation of landscape-scale genetic data
- Planned and led complex field sampling and prairie restoration projects across the Midwest

University of Minnesota Duluth

Graduate Teaching Assistant | 2009 –2011

- Deployed fluorometers to quantify the photosynthetic efficiency of phytoplankton through the water column of Lake Superior and Lake Malawi
- Built a versatile suite of MATLAB scripts to process, visualize, and analyze the fluorescence profiles
- Identified strong daily changes in photosynthetic potential in Lake Superior and determined the zone of maximum photosynthetic production was deeper than previously described

PUBLICATIONS

- Junier P, Cailleau G, Palmieri I, Vallotton C, Trautschold OC, Junier T, Paul C, Bregnard D, Palmieri F, Estoppey A, Buffi M, Lohberger A, Robinson A, Kelliher JM, Davenport K, House GL, Morales D, Gallegos-Graves LV, Dichosa AEK, Lupini S, Nguyen HN, Young JD, Rodrigues DF, Parra-Vasquez ANG, Bindschedler S, Chain PSG. 2021. **Democratization of fungal highway columns as a tool to investigate bacteria associated with soil fungi**. *FEMS Microbiology Ecology* fiab003, <https://doi.org/10.1093/femsec/fiab003>
- Delavaux CS, Schemanski JL, House GL, Tipton AG, Sikes B, Bever JD. 2021. **Root pathogen diversity and composition varies with climate in undisturbed grasslands, but less so in anthropogenically disturbed grasslands**. 2021. *The ISME Journal* 15: 307-317
- Palmieri F, Estoppey A, House GL, Lohberger A, Bindschedler S, Chain PSG, Junier P. 2019. **Oxalic acid, a molecule at the crossroads of bacterial-fungal interactions**. *Advances in Applied Microbiology* 106: 49-78.
- Junier P, Paul C, Filippidou S, Jamil I, House GL, Kooli W, Estoppey A, Hayoz M, Junier T, Lohberger A, Palmieri F, Wunderlin T, Lehmann A, Bindschedler S, Vennemann T, Chain PSG. 2019. **Bacterial spores, from ecology to biotechnology**. *Advances in Applied Microbiology* 106: 79-112.
- House GL and Bever JD. 2019. **Biochar soil amendments in prairie restorations do not interfere with benefits from inoculation with native arbuscular mycorrhizal fungi**. *Restoration Ecology* 28:785-795 DOI: 10.1111/rec.12924
- Koziol L, Schultz PA, House GL, Bauer JT, Middleton EL, Bever JD. 2018. **The plant microbiome and native plant restoration: The example of native mycorrhizal fungi**. *BioScience* 68:996-1006
- House GL and Hahn MW. 2018. **Evaluating methods to visualize patterns of genetic differentiation on a landscape**. *Molecular Ecology Resources* 18:448-460
- House GL and Bever JD. 2018. **Disturbance reduces the differentiation of mycorrhizal fungal communities in grasslands along a precipitation gradient**. *Ecological Applications* 28:736-748
- House GL, Ekanayake S, Ruan Y, Schütte UME, Kaonongbua W, Fox G, Ye Y, Bever JD. 2016. **Phylogenetically structured differences in rRNA gene sequence variation among species of arbuscular mycorrhizal fungi and their implications for sequence clustering**. *Applied and Environmental Microbiology* 82:4921-4930
- Ruan Y, House GL, Ekanayake S, Schütte U, Bever JD, Tang H, Fox G. 2014. **Integration of clustering and multidimensional scaling to determine phylogenetic trees as spherical phylograms visualized in 3 dimensions**. In *CCGrid 2014: 14th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing*, pp. 720-729

AWARDS

- Best post-doctoral poster award. International Mycological Congress July 2018, San Juan Puerto Rico
- LANL SPOT Award for assistance with Next Generation Sequencing and Bioinformatics Workshop, May 2018

TALKS

Invited

The Microbiome of Fungi. Villars, Switzerland. Villars Symposium, September 2018

Contributed

- **Screening fungal genome sequencing data and culture collections to better understand bacterial:fungal interactions**. Santa Fe, NM. Sequencing, Finishing, and Analysis in the Future Meeting. May 2019
- **Screening fungal genome sequencing projects and culture collections to better understand the bacterial diversity associated with fungi**. San Juan, PR. International Mycological Congress. July 2018.

- **Diversity and functions of bacterial:fungal interactions.** San Juan, PR. International Mycological Congress. July 2018. Invited talk.
- **Using data mining and high-throughput cultivation methods to better understand bacterial:fungal interactions.** Santa Fe, NM. Sequencing, Finishing, and Analysis in the Future Meeting. May 2018
- **Evaluating methods for understanding population structure on a landscape.** Evolution annual meeting, Austin, TX. June 2016
- **Biotic and abiotic soil amendments in prairie restorations: arbuscular mycorrhizal fungi and biochar.** Baltimore, MD. Ecological Society of America annual meeting. August 2015
- **Exploring the genetic diversity of mutualistic arbuscular mycorrhizal (AM) fungi.** Bloomington, IN. Midwest Ecology and Evolution Conference. March 2015
- **Use of biochar soil amendments and inoculation with arbuscular mycorrhizal fungi in prairie restorations.** Indianapolis, IN. Indiana Academy of Science annual meeting. March 2015
- **Use of biochar soil amendments and inoculation with arbuscular mycorrhizal fungi in prairie restorations.** Sacramento, CA. Ecological Society of America annual meeting. August 2014
- **Changes in plant growth and soil properties associated with biochar and arbuscular mycorrhizal fungi added to the soil of a prairie restoration.** Indianapolis, IN. Indiana Academy of Science annual meeting. March 2014
- **Photosynthetic efficiency of phytoplankton in large lakes: A comparison between Lake Malawi and Lake Superior.** West Lafayette, IN. International Association for Great Lakes Research (IAGLR) annual meeting. June 2013
- **Phytoplankton photosynthetic efficiency in the deep chlorophyll layer (DCL) of Lake Superior during the summer of 2010.** Duluth, MN. International Association for Great Lakes Research (IAGLR) annual meeting. May 2011

Institutional

Taxonomic Classification Los Alamos National Laboratory Next Generation Sequencing and Bioinformatics Workshop May 2018

RESEARCH GRANTS

Indiana Academy of Science Senior Research Grant (\$2861)	Spring 2013 – Fall 2014
Indiana University Research and Teaching Preserve Research Grant (\$498)	Spring 2013

TEACHING AND MENTORING EXPERIENCE

<i>National Ecological Observatory Network</i>	Summer 2020
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Mentored undergraduate from an under-represented group in developing Python translation of R analysis code in order to reach broader user-base

<i>Los Alamos National Laboratory</i>	Fall 2017 – Present
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Mentored three undergraduate students in aseptic culturing techniques, developing bioinformatics analysis pipelines, and undertaking research projects

<i>Indiana University Bloomington</i>	Fall 2012 – Spring 2013; Spring – Summer 2016
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Laboratory instructor for Introductory Biology and Vascular Plants

- Guided 20 students through planning and completing independent research projects
 - Trained three other associate instructors and assisted students in plant taxonomy labs
- Mentor for high school student in the Jim Holland Summer Science Research Program (2016)

<i>University of Minnesota Duluth</i>	Fall 2009 – Spring 2011
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Graduate teaching assistant for General Biology II

- Facilitated two interactive group discussion sections per week, each with 24 students
- Led diverse lab exercises in areas such as biodiversity and physiology and promptly graded lab reports

PROFESSIONAL MEMBERSHIPS

American Society of Naturalists
Ecological Society of America
Sigma Xi