Andrew Morris

Postdoctoral Scholar

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Education

2022 **PhD Biology**, *University of Oregon*, Eugene, OR.

2017 **MS Soil Science**, *Penn State University*, State College, PA.

2014 **BS Plant Sciences**, *Cornell University*, Ithaca, NY.

Experience

2022–present **Postdoctoral Scholar**, *University of Oregon*, Eugene, OR.

- Developed a novel framework for understanding microbiome heritabiliy in humans and animals, manuscript in prep.
- Submitted a first-author publication to *ISME Communications*.
- Presented original research on the heritability and function of the microbiome at the *International Society of Microbial Ecology* meeting in Lausanne, Switzerland.

2017–2022 **NSF Graduate Research Fellow**, *University of Oregon*, Eugene, OR.

- Assembled microbial genomes and performed comparative genomics across ecosystems using microbiome metagenomic data.
- Engineered microbiomes that consume greenhouse gases at high rates using laboratory selection experiments.
- Published a first-author paper on integrating quantitative genetics with microbiome science in *Philosophical Transactions of the Royal Society*.
- Awarded multiple grants and fellowships including the National Science Foundation Graduate Research Fellowship and named an ARCS Scholar by the Oregon chapter of the ARCS Foundation.
- Presented research to members and potential donors at the Oregon ARCS Foundation meeting.

2015–2017 **Graduate Research Assistant**, *Penn State University*, State College, PA.

- Demonstrated a new approach to reducing the impact of agriculture on climate change by decreasing microbiome-mediated nitrous oxide emissions.
- Led field teams and mentored undergraduate research assistants.
- Collaborated with a team of over 14 scientists and industry partners.
- Presented research at scientific meetings including *The Ecological Society of America* and the *Soil Science Society of America*.
- Communicated results to non-science audiences including farmers, technicians, and extension educators.

Skills

Formal Training.

- Advanced biostatistics coursework with both frequentist and Bayesian inference using `R` and `Stan`.
- Training in bioinformatics at the Marine Biology Laboratory in Woods Hole, MA using `R`, `Python`, and `QIIME2` to analyze deep marker gene and metagenomic data.
- Intensive workshop in machine learning for image analysis using deep neural networks with `Keras` and `TensorFlow` through the University of Oregon Data Science Initiative.

Microbiome Analysis.

- 16S rRNA gene amplicon analyses using `R`, `phyloseq`, and `QIIME2`.
- Short-read shotgun metagenomic analyses including read recruitment, gene calling, taxonomic and functional annotation, contig assembly, genome binning, and comparative genomics.
- Statistical analyses in `R` including linear mixed effects models with crossed, nested, and repeated measures designs as well as non-parametric tests (Kruskal-Wallis, Wilcoxon, etc.).
- Microbiome analyses including ecological dissimilarity metrics (Bray-Curtis, Jaccard, UniFrac, etc.), PCoA and NMDS ordinations, PERMANOVA, Mantel tests, and differential abundance tests.

Coding `R`, `Bash`, `Python`, `git`, Github Computing Linux, Unix, HPC, cloud computing

Selected Publications

2023 **Morris, AH** and Bohannan, BJM. Artificial ecosystem selection reveals relationships between microbiome composition and ecosystem function. In review at *ISME Communications*

2021 **Morris, AH**, Isbell, SA, Saha, D and Kaye, JP. Mitigating nitrogen pollution with under-sown legume-grass cover crop mixtures in winter cereals. *Journal of Environmental Quality*

2020 Meyer, KM, **Morris, AH**, Webster, K, Klein, A, Kroegerv, ME, Meredith, LK, et al. Belowground changes to community structure alter methane-cycling dynamics in Amazonia. *Environment International*

2020 Meyer, KM, Hopple, AM, Klein, A, **Morris, AH**, Bridgham, SD, and Bohannan, BJM. Community structure–ecosystem function relationships in the Congo Basin methane cycle depend on the physiological scale of function. *Molecular Ecology*

2020 **Morris, AH**, Meyer, KM, and Bohannan, BJM. Linking microbial communities to ecosystem functions: what we can learn from genotype–phenotype mapping in organisms. *Philosophical Transactions of the Royal Society B: Biological Sciences*

Selected Presentations

2022 **Morris, AH**, Bohannan, BJM. Artificial ecosystem selection reveals relationships between microbiome composition and ecosystem function. *ISME Meeting*. Lausanne, Switzerland.

2019 **Morris, AH**, Meyer, KM, Bohannan, BJM. Linking microbial communities to ecosystem functions: what we can learn from genotype-phenotype mapping in organisms. *Achievement Rewards for College Scientists Annual Luncheon*. Portland, OR.

2017 **Morris, AH**, Isbell, S, Kaye, JP. Improving nitrogen retention of agroecosystems using interseeded cover crops. *Ecological Society of America Meeting*. Portland, OR.

2016 **Morris, AH**, Isbell, S, Kaye, JP. Managing Inter-Seeded Cover Crops and Tillage to Decrease Nitrate Leaching and Nitrous Oxide Emissions from Agricultural Soils. *Soil Science Society of America Meeting*. Phoenix, AZ.

Teaching

2018 Faculty, Juneau Icefield Research Program: Geobotany and Ecology

2018 Guest Lecture on Evolutionary Processes, University of Oregon: Ecology and Evolution

2018 Teaching Assistant, University of Oregon: Ecology and Evolution, Genetics and Molecular Biology, Cells

2017 Teaching Assistant, Penn State University: Soil Science