ZOEY WERBIN, PhD

Austin, TX

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Data scientist with 7+ years of research and industry experience in soil microbiome, genomic, and field data. Trained in Bayesian modeling, experimental design, and uncertainty quantification; builds machine learning models, bioinformatics workflows, and data pipelines in Python, R, and SQL.

EXPERIENCE

Funga PBC May 2025 - Present
Ecological Data Scientist *Austin, TX (Hybrid)*

- Scope and run analyses for large-scale soil sampling, field trials, and carbon projects, from study design to final reports
- Build machine learning models linking soil fungal communities to pine growth and survival, to predict fungal inoculant performance and inform treatment recommendations
- Design soil sampling campaigns using geospatial data and aerial imagery (Google Earth Engine, NAIP)
- Built an automated pipeline for analyzing randomized field trials (spatiotemporal mixed models, bootstrap uncertainty, survival analysis), with simulation-based validation and automated tests
- Support development of amplicon sequencing pipelines (Nextflow, DADA2); help design a PostgreSQL data platform for field and sequencing data
- Lead development of a QR-code scanning workflow for end-to-end tracking of thousands of shipped soil samples and their sequence data

Nature Tech Collective Jan 2025 - May 2025
Head of Research *Boston, MA*

- Data analysis, report writing, and proposal development on biodiversity monitoring and ecosystem services projects
- Authored research reports on startups and companies building tools for biodiversity monitoring

Boston University, Dept of Biology Sept 2018 - Aug 2024
Graduate Research Assistant, PI: Jennifer Bhatnagar *Boston, MA*

- Forecast the composition and activity of soil fungi, bacteria, and archaea across U.S. NEON sites
- Showed that soil microbiome predictability increases with spatial and taxonomic scale
- Built a genome database that improved detection of fungi and uncultivated microbes in soil metagenomes
- Led collaborative projects and delivered findings at 15+ conference talks

Earlier Research Roles 2015 - 2018

- **Swarthmore College**, Project Scientist (2018): extinction trend analysis; co-wrote funded NSF grant
- **Oak Ridge National Lab**, Research Intern (2017–2018): R package and R Shiny tools for NASA data
- **Florida State University**, Research Assistant (2017): metagenomics pipelines for ocean microbes
- **Univ. of São Paulo (Swarthmore)**, Research Assistant (2016): spatial analysis of beetle parasites
- **Academy of Natural Sciences (Drexel)**, Research Assistant (2015): fossil morphometric analysis

EDUCATION

Boston University September 2018 - August 2024
PhD in Biology, Certificate in Biogeoscience *Boston, MA*
· Advisors: Jennifer Bhatnagar and Michael Dietze

Swarthmore College September 2013 - May 2017
BA in Biology, Minor in Environmental Studies *Swarthmore, PA*

SKILLS

Programming	R, Python, SQL (PostgreSQL), Bash shell scripting, MATLAB, LaTeX, HTML5/CSS
Bioinformatics	amplicon sequencing (16S, ITS), DADA2, metagenomics, metatranscriptomics, genome assembly, functional gene analysis, genome-scale metabolic modeling, flux-balance analysis (FBA)
Statistics & ML	machine learning (XGBoost, gradient boosting), predictive modeling, Bayesian hierarchical state-space modeling, field trial design (randomized block designs), uncertainty and measurement error propagation, spatial analysis
Data engineering	PostgreSQL, ETL pipelines, Windmill, Nextflow, Snakemake, Docker, AWS, Databricks, cloud computing
Other tools	Git/GitHub, ArcGIS, QGIS, JAGS, NIMBLE, Circos, R Shiny

AWARDS AND FELLOWSHIPS

Graduate Research Fellowship Fall 2021-Summer 2024
National Science Foundation *$138,000 total*

Microbiome Fellowship Spring and Fall 2020
Boston University Microbiome Initiative *$34,000*

Dean's Fellowship Fall 2018
Boston University Graduate School of Arts & Sciences *$28,325*

NSF Sedimentary Geology and Paleobiology Award #1760634 (co-author) 2018-2019
"RUI: Comparing age selectivity in modern extinctions and the fossil record." *total budget: $54,059*

Peter and Aleck Karis Fellowship in Environmental Studies Summer 2016
Swarthmore, PI: Elizabeth Nichols *$4350*

Conference Travel Awards (9) 2016-2023
BU Biology, BU Biogeoscience Program, Ecological Society of America, Swarthmore *$200-$1000 each*

SERVICE, TEACHING AND OUTREACH

Peer Review

· Referee for Biogeochemistry, Global Change Biology, Fungal Ecology, Science Advances, Scientific Reports, Journal of Ecology, Soil Biology and Biochemistry, mBio, mSystems, Journal of Applied Ecology.

Prospective Scholars Mentor Apr 2021 - Aug 2024
Boston University

Graduate Women in Science and Engineering (GWISE) Mentor Sept 2018 - Aug 2024
Boston University

Ecological Forecasting Summer Course July 2019 - July 2021
Boston University *Boston, MA*