

# Cassandra Wattenburger

SOIL AND PLANT HEALTH · BIOINFORMATICS · DATA SCIENCE

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## Education

### Cornell University, Ph.D. (in progress)

SOIL SCIENCE, MINORS IN GENOMICS AND MICROBIOLOGY

*Ithaca, NY*

*Jan. 2018 - Aug. 2023*

### Iowa State University, M.S.

MICROBIOLOGY

*Ames, IA*

*Sept 2015 - Dec 2017*

### Western Washington University, B.S.

CELLULAR AND MOLECULAR BIOLOGY, MINOR IN CHEMISTRY, HONORS PROGRAM

*Bellingham, WA*

*Sept 2010 - June 2014*

## Research Experience

### Graduate Research Assistant (Ph.D.)

CORNELL UNIVERSITY | ADVISOR DR. DANIEL BUCKLEY

*Ithaca, NY*

*Jan. 2018 - present*

- Dissertation topic: Measuring in situ population dynamics to understand microbial life history strategies relevant to carbon cycling

### Graduate Research Assistant (M.S.)

IOWA STATE UNIVERSITY | ADVISORS DR. LARRY HALVERSON & DR. KIRSTEN HOFMOCKEL

*Ames, IA*

*Sept. 2015 - Dec. 2017*

- Thesis topic: Understanding the role of bacterial and fungal root-associated communities in agricultural management for nitrogen use efficiency

### Student Undergraduate Learning Internship Intern

PACIFIC NORTHWEST NATIONAL LABORATORY | MENTOR DR. VANESSA BAILEY

*Richland, WA*

*Summers 2011 - 2014*

- Project 1: Fungal and bacterial community contributions to soil respiration in arid agricultural soils
- Project 2: Method development for extracting DNA from the soil community within single soil aggregates
- Project 3: Effect of gradual warming on cellulose-decomposing soil community structure and exometabolite production

### Young Women in Science Intern

PACIFIC NORTHWEST NATIONAL LABORATORY | MENTOR DR. VANESSA BAILEY

*Richland, WA*

*Summers 2010*

- Project: Culture condition optimization for cellobiose-degrading soil bacteria isolates

## Grants & Awards

2021 **AFRI Pre-Doctoral Fellowship**, USDA NIFA, \$120,000

*USA*

2019 **SNIPS Small Grant Award**, Cornell University, Co-PI with Kyle Martin, \$8,511

*Ithaca, NY*

2016 **NSF GRFP**, Ecology, National Science Foundation Fellowship, \$138,000

*USA*

2016 **Brown Graduate Fellowship**, Iowa State University, \$10,000

*Ames, IA*

2015 **Diane-Brandt Scholarship**, Iowa State University, \$5,000

*Ames, IA*

2015 **CALS+Presidential Fellowship**, Iowa State University, \$25,000

*Ames, IA*

2013 **Hodgson Family Scholarship**, Western Washington University, \$1,000

*Bellingham, WA*

2010 **President's Scholarship**, Western Washington University, \$4,000

*Bellingham, WA*

## Publications

Foxx AJ, Franco Meléndez KP, Hariharan J, Kozik AJ, **Wattenburger CJ**, Godoy-Vitorino F, Rivers AR. Advancing Equity and Inclusion in Microbiome Research and Training. [mSystems 0:e01151-21. \(2021\)](#)

Karig DE, Mayers CG, **Wattenburger CJ**, Southon J. Contamination of Radiocarbon Analyses of Plant Samples by Fungal Hyphae. [Radiocarbon 1–8. \(2020\)](#)

**Wattenburger CJ**, Gutknecht J, Zhang Q, Brutnell T, Hofmockel KS, Halverson, LJ, 2020. The rhizosphere and cropping system, but not arbuscular mycorrhizae, affect ammonia oxidizing archaea and bacteria abundances in two agricultural soils. [Applied Soil Ecology 151, 103540 \(2020\).](#)

**Wattenburger CJ**, Halverson LJ, Hofmockel KS. Agricultural Management Affects Root-Associated Microbiome Recruitment Over Maize Development. Phytobiomes Journal 3, 260–272 (2019).

## Presentations

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### TALKS

#### **Bacterial growth and death dynamics during litter decomposition indicate shifts in life history strategy**

NEMPET22

*Blue Mountain Lake, NY*

*June 2022*

#### **Land use and resource amendment impact in situ bacterial growth responses in soils**

ECOLOGICAL SOCIETY OF AMERICA

*Virtual*

*Aug. 2021*

#### **Predicting microbial life history traits from their growth dynamics in soil**

SOIL AND CROP SCIENCES SEMINAR SERIES | CORNELL UNIVERSITY

*Ithaca, NY*

*Sept. 2020*

#### **The root-associated microbiome and agricultural nitrogen use efficiency**

M.S. EXIT SEMINAR | IOWA STATE UNIVERSITY

*Ames, IA*

*Nov. 2017*

#### **Spatio-temporal dynamics of root-associated prokaryotic communities in two contrasting agroecosystems**

INTERDEPARTMENTAL MICROBIOLOGY PROGRAM RETREAT | IOWA STATE UNIVERSITY

*Ames, IA*

*Oct. 2017*

#### **Soil Microorganisms, Climate Change, and Soil Quality**

HONORS THESIS PRESENTATION | WESTERN WASHINGTON UNIVERSITY

*Bellingham, WA*

*March 2014*

#### **Studying individual soil aggregates as discrete habitats for microbial communities**

STUDENT UNDERGRADUATE LEARNING INTERNSHIP SYMPOSIUM | PACIFIC NORTHWEST NATIONAL LABORATORY

*Richland, WA*

*Aug. 2014*

### POSTERS

#### **Population dynamics of soil bacterial communities during litter decomposition**

ISME18

*Lausanne, Switzerland*

*Aug. 2022*

#### **Comparing in-situ, individual bacterial community growth rates in cropped and successional soils using a 16S rRNA internal standard**

DOE GENOME SCIENCES PROGRAM MEETING

*Virtual*

*Feb. 2021*

#### **Arbuscular mycorrhizae alter soil inorganic and plant nitrogen but have little effect on ammonia oxidizing community abundance in two agricultural soils**

ECOLOGICAL SOCIETY OF AMERICA CONFERENCE

*Portland, OR*

*Aug. 2017*

#### **In contrasting cropping systems, root-associated prokaryotic and fungal communities exhibit distinct shifts at different maize developmental stages**

MULTIOMICS FOR MICROBIOMES EMSL INTEGRATION CONFERENCE

*Pasco, WA*

*Aug. 2017*

#### **Revisiting fungal-to-bacterial activity ratios in soils ten years later**

STUDENT UNDERGRADUATE LEARNING INTERNSHIP SYMPOSIUM | PACIFIC NORTHWEST NATIONAL LABORATORY

*Richland, WA*

*Aug. 2011*

### NON-SCIENTIFIC

#### **Data Visualization Toolkit**

CAREERS BEYOND ACADEMIA | CORNELL UNIVERSITY

*Virtual*  
*March 2020*

#### **Professionalism in Graduate School**

CAREERS BEYOND ACADEMIA | CORNELL UNIVERSITY

*Virtual*  
*July 2020*

## Teaching & Mentoring

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### Carpentries Instructor

THE CARPENTRIES

- Certified instructor for Software and Data Carpentries workshops

*Ithaca, NY*

*April 2021*

### Moderator

INTRODUCTION TO R WORKSHOP | WOMEN IN SOIL ECOLOGY

- Assisted workshop organizers and answered attendee questions

*Virtual*

*Feb. 2021*

### Mentor

IOWA STATE UNIVERSITY AND CORNELL UNIVERSITY

- Interviewed, hired, and trained six undergraduate students in basic lab techniques and/or bioinformatics skills
- Overseeing honors-thesis research project for Cornell biology undergraduate
- Provided career advice post-graduation and served as reference on job applications

*Various*

*2017 - present*

### Undergraduate Teaching Assistant

BIOL 205 | WESTERN WASHINGTON UNIVERSITY

- Cell and Molecular Biology Lab
- Guided student learning and answered questions during labs
- Designed and taught short lecture on polymerase chain reaction

*Bellingham, WA*

*Winter 2014*

## Leadership

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### Data Leader

VACCINATION CONVERSATIONS WITH SCIENTISTS | DATA LEADERSHIP | CORNELL UNIVERSITY

- Created reproducible analysis workflow in R Markdown and GitHub
- Processed and prepared data collected by phone-banking software to derive insights regarding COVID vaccine rates, common vaccination concerns, and phone-banking efficacy, visualized findings
- Collaborated with other data leaders to identify analysis priorities and data limitations
- Communicated findings to broader leadership and organization members

*Ithaca, NY*

*Mar. 2022 - present*

### President & Treasurer

SOIL AND CROPS SCIENCES GRADUATE STUDENT ASSOCIATION | CORNELL UNIVERSITY

- Created and managed budgets as Treasurer, lead association activities as President
- Coordinated external speaker visit to Soil and Crop Sciences section seminar series
- Planned and hosted 2020 and 2021 Soil and Crops Sciences graduate student recruitment and tour events, virtually and in-person

*Ithaca, NY*

*Aug. 2019 - 2022*

### Advisory Board Member

CAREERS BEYOND ACADEMIA | CORNELL UNIVERSITY

- Guided Careers Beyond Academia programming
- Designed and presented webinars for professional development, including professionalism and data visualization
- Organized and hosted career panels

*Ithaca, NY*

*Aug. 2020 - 2021*

### President & Treasurer

MICROBIOLOGY GRADUATE STUDENT ORGANIZATION | IOWA STATE UNIVERSITY

- Created and managed budget as Treasurer, lead monthly meetings as President
- Organized and volunteered in science outreach events for Iowan students
- Invited and hosted Interdepartmental Microbiology program seminar speakers

*Ames, IA*

*Aug. 2015 - 2017*

### Vice-President & Treasurer

ASSOCIATION OF WOMEN IN SCIENCE | WESTERN WASHINGTON UNIVERSITY

- Created and managed organization budget and finances
- Assisted president with meeting and event planning
- Started and raised money for small scholarship to be offered to women at Western Washington University

*Bellingham, WA*

*2013, 2014*

## Service

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### Server Administrator (Linux)

BUCKLEY LAB | CORNELL UNIVERSITY

- Created step-by-step server on-boarding instructions and made accessible via GitHub
- Created new user accounts and managed access to files and data stored on server
- Wrote general-use scripts in bash, Python, and Jupyter Notebook for common needs

*Ithaca, NY*

*Jan. 2022 - present*

## Data Visualization and Science Art Panelist

COMSciCON-NY 2021

- Volunteered as expert panelist to discuss questions about effective ways to engage with audiences using data visualization and science art

*Virtual*

*May 2021*

## Careers in Data Visualization Panel Organizer

CAREERS BEYOND ACADEMIA | CORNELL UNIVERSITY

- Organized and hosted zoom panel interviewing scientists in data visualization careers

*Ithaca, NY*

*April 2021*

## Non-academic Careers Alumni Panel Organizer

BESS GSA | CORNELL UNIVERSITY

- Biogeochemistry, Environmental Science, and Sustainability Graduate Student Organization
- Organized and hosted zoom panel of three Cornell alumni in non-academic careers

*Ithaca, NY*

*April 2020*

## Peer Review

VARIOUS JOURNALS

- Peer reviewed six manuscripts
- Journals: Soil Biology and Biochemistry, Microbial Ecology, SOIL

*Various*

## Newsletter Editor

CAREERS BEYOND ACADEMIA | CORNELL UNIVERSITY

- Published monthly newsletter distributed to over 400 people using MailChimp
- Interviewed Cornell students and staff for spotlight pieces
- Wrote content

*Ithaca, NY*

*Aug. 2018 - Aug. 2019*

## GitHub Repository Manager

BUCKLEY LAB | CORNELL UNIVERSITY

- Responsible for organizing and making accessible Buckley lab protocols and scripts
- Wrote and updated standard operating protocols in markdown using version control

*Ithaca, NY*

*Jan. 2018 - present*

## Curriculum Committee Member

INTERDEPARTMENTAL MICROBIOLOGY PROGRAM | IOWA STATE UNIVERSITY

- Conducted research and gave feedback to faculty to improve graduate program curriculum

*Ames, IA*

*2015*

## Outreach & Sci. Comm.

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### Organizer & Volunteer

USA SCIENCE FESTIVAL

- Created and organized activities for a microbiome-themed educational booth
- Educated children and adults about environmental microbiology and microscopy

*Washington DC, USA*

*March 2018*

### Organizer & Volunteer

WHO'S IN YOUR FOOD? | IOWA STATE UNIVERSITY

- Gave presentation and designed interactive workshop with fermented food products for local elementary school students

*Ames, IA*

*Feb. 2017*

### EcoDay Science Fair Judge

NEVADA ELEMENTARY SCHOOL

- Judged and provided feedback on science fair projects at Nevada Elementary School

*Nevada, IA*

*May 2015*

### Organizer & Volunteer

EDWARDS ELEMENTARY SCIENCE NIGHT

- Created hands-on activities to teach children about bacteria
- Lead the "build-a-bacteria" and microscopy stations

*Ames, IA*

*2015, 2016*

### Soils Session Leader

WHITEROCK BIOBLITZ | THE WHITEROCK CONSERVANCY

- Created and lead hands-on activities introducing concepts of soil health and ecology to general public

*Coon Rapids, IA*

*2015, 2016*

### "Soil Breathes"

MATERIALS: SOIL AND CLAY

- [Link to image of art piece](#)
- Collaboration with Bonita Robins and Cecelia Hanford
- Art piece of noses and mouth casts made of soil collected from campus grounds depicting soil respiration
- Displayed in the Western Gallery at Western Washington University

*Bellingham, WA*

*March 2014*

## ”Seeing through the Ice”

INVITED SPEAKER | WHATCOM MUSEUM

- Short talk to the general public explaining the science of climate change using art of glaciers

Bellingham, WA

Feb 2014

## Science Club Instructor

BOYS AND GIRLS CLUB

- Lead afternoon activities to engage children in STEM concepts
- Robotics and microbiology focused

Bellingham, WA

Summer 2014

## Diversity, Equity, & Inclusion

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### IDP Fellow

INTERGROUP DIALOGUE PROJECT | CORNELL UNIVERSITY

Ithaca, NY

Aug. 2021 - present

- Organized and facilitated workshops to teach Cornell students, post-docs, and staff listening and communication skills
- Taught communication across difference, strategic and generative questioning, and social identity recognition

### Volunteer

DIVERSITY PREVIEW WEEKEND | CORNELL UNIVERSITY

Ithaca, NY

Sept. 2020

- Provided feedback and individual mentoring on graduate school application materials
- Served on panels to answer questions about applying for research fellowships

### Volunteer

EXPANDING YOUR HORIZONS | CORNELL UNIVERSITY

Ithaca, NY

2018, 2019

- Escorted young participants to activities around campus
- Participated in science workshop and outreach events with attendees

### Organizer & Volunteer

SCIENCE BOUND | IOWA STATE UNIVERSITY

Ames, IA

2016, 2017

- Organized and lead demonstrations educating students about leaf-associated microbes and general microbiology
- Included activities such as leaf-press culturing, live pond-water microscopy station, fermented food trivia, antibiotic resistance dodge ball, etc.

### Volunteer & Panelist

MICROBIOLOGY CASE STUDY WORKSHOP | IOWA STATE UNIVERSITY

Ames, IA

Aug. 2016

- Taught high school students from underprivileged backgrounds microbiology lab techniques, such as aseptic technique and pipetting
- Participated on panel to answer questions about higher education and majoring in STEM

## Training

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2022	<b>Introduction to Bayesian Statistical Methods</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2022	<b>Missing Data</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2021	<b>Exploratory Factor Analysis</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2021	<b>Carpentries Instructor</b> , certification to teach programming workshops	The Carpentries
2021	<b>Statistical Learning</b> , audit, 10 week course, supervised and unsupervised methods	edX Stanford
2020	<b>Collaborative and Reproducible Data Science in R</b> , 2 credit graduate-level course	Cornell U.
2020	<b>Linear Models: Regression and ANOVA</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2020	<b>Repeated Measures</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2020	<b>Intermediate Statistical Analysis Using R</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2018	<b>Principle Components Analysis</b> , Cornell Statistical Consulting Unit workshop	Cornell U.
2017	<b>Data Wrasslin' in R</b> , R tidyverse and tidy-data principles workshop	Iowa State U.
2017	<b>Data Visualization</b> , R and ggplot2 basics workshop	ESA
2016	<b>Statistical Design and the Analysis of Experiments</b> , 4 credit course	Iowa State U.
2015	<b>Statistical Methods for Research Workers</b> , 4 credit course	Iowa State U.

## Blog Contributions

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### **Write better grants**

BLOGGING BEYOND ACADEMIA

*Ithaca, NY*

*Aug. 2019*

### **Explaining science to kids builds vital career skills**

BLOGGING BEYOND ACADEMIA

*Ithaca, NY*

*Oct. 2018*