

Grant Foster

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Interests

Ecological Networks · Theoretical Ecology · Community Assembly Dynamics · Disease Ecology · Undergraduate Biology/Ecology Education

Education

- 2022 – Present **University of South Carolina** – Columbia, South Carolina
Ph.D. Biology (in progress)
Advisor: Dr. Tad Dallas. *GPA: 4.00/4.00*
- 2020 – 2021 **Louisiana State University** – Baton Rouge, Louisiana
Ph.D. Biology (in progress)
Advisor: Dr. Tad Dallas. *GPA: 4.11/4.30.*
- 2016 – 2020 **University of Georgia** – Athens, Georgia
B.S. Ecology; B.S. Biology
Marine Science Emphasis
Highest Honors Graduation Distinction, *summa cum laude*
Research Mentors: Dr. Andrew Park, Dr. William Fitt. *GPA: 3.93/4.00.*

Teaching experience

- Spring 2024 **Co-Instructor of Record, Parasitology (University of South Carolina)**
Co-teaching an upper level undergraduate/graduate course on Parasitology and Ecology of Infectious Diseases alongside Dr. Tad Dallas. Responsible for creating all lab materials and assessments, as well as contributed to lecture materials and assessments. Instructed all laboratory sections, as well as a number of lectures. All materials created for the course are freely available at <https://dallaslab.github.io/diseaseEcology/>.
- Spring 2023 - Fall 2023 **TA, Ecology and Evolution Laboratory (University of South Carolina)**
Supervisor: Dr. Trey Franklin (University of South Carolina)
- Fall 2022 **TA, Principles of Biology II Laboratory (University of South Carolina)**
Supervisor: Dr. Eilea Knotts (University of South Carolina)
- May 2019 **TA, Tropical Marine Invertebrates (University of Georgia)**
Supervisor: Dr. Bill Fitt (University of Georgia)
- Spring 2019 **TA, Ecological Basis of Environmental Issues (University of Georgia)**
Supervisor: Dan Hawkins (University of Georgia)
- March 2023 **Guest Lecturer, Theoretical Ecology (University of South Carolina)**
Instructor: Dr. Tad Dallas
Gave guest lecture to class of 12 graduate students on creating and analyzing generalized Lotka-Volterra models of multispecies communities.
- March 2024 **Lecturer, Parasitology (University of South Carolina)**
Lecture on link prediction in host-parasite interaction networks

Pedagogical Training

- Awarded Spring 2024 Certificate: Intercultural Inclusion and Diversity Learning Series
 USC Center for Teaching Excellence
Part of a cohort of educators meeting for monthly seminars (8hrs) and group discussions centering on themes diversity, inclusion, and creating learning environments that foster the co-creation of knowledge with a diverse set of learners
- Fall 2023 Course: Scientific Teaching and Pedagogy (BIOL757)
 University of South Carolina
Was one of 3 students in a semester-long, discussion-based course designed to introduce graduate students to best practices in scientific teaching and pedagogy in order to prepare them to serve as Instructors of Record (IoR) at USC following successful completion.
- Awarded Fall 2023 Certificate: Teaching Towards Inclusive Excellence
 USC Center for Teaching Excellence
Participated in a series of eight seminars (10hrs) united under themes of integrating pedagogical principles aligned with inclusive excellence into the classroom environment.
- Awarded Spring 2023 Certificate: Fostering Proactive Learning Environments
 USC Center for Teaching Excellence
Participated in a series of six seminars (8hrs) united under themes of proactive and reactive strategies for handling student misconduct, avoiding and addressing classroom conflicts, and fostering a sense of belonging in the classroom.
- Awarded Spring 2023 Certificate: Integrative and Experiential Learning
 USC Center for Teaching Excellence
Participated in a series of six seminars (8hrs) united under themes of encouraging students to explore, reflect on, and transfer knowledge between learning experiences within and beyond their academic curriculum.
- Awarded Spring 2023 Certificate: Mental Health & Well-being Competency
 USC Center for Teaching Excellence
Participated in a series of five seminars (7hrs) united under themes of helping instructors feel better equipped to talk about and respond to the growing mental health needs of today's students.
- October 2022 USC OktoberBest Teaching Symposium
 Attendee
- August 2022 Short Course: Bringing computational data sciences to your undergraduate ecology classroom
 Ecological Society of America Meeting

Publications

- 2022 **Epidemic time series similarity is related to geographic distance and age structure**
 Tad Dallas, **Grant Foster**, Robert L. Richards, and Bret Elderder.
Infectious Disease Modeling
<https://doi.org/10.1016/j.idm.2022.09.002>
- 2022 **Estimating R0 from Early Exponential Growth: Parallels between 1918 Influenza and 2020 SARS-CoV-2 Pandemics**
Grant Foster, Bret Elderder, Tad Dallas, Robert L. Richards.
PNAS: Nexus
<https://doi.org/10.1093/pnasnexus/pgac194>
- 2020 **What determines parasite species richness across host species?**
 Tad Dallas, Lauren Holian, **Grant Foster**.
Journal of Animal Ecology.
<https://doi.org/10.1111/1365-2656.13216>
- In prep.* **Comparing Waves of COVID-19 in the US: Scale of response changes over time**
 Robert L. Richards, **Grant Foster**, Bret Elderder and Tad Dallas.
 Manuscript submitted for publication <https://doi.org/10.1101/2022.03.01.22271713>

- In prep.* **Preparing for the next pandemic: Learning lessons from the recent past**
Bret Elderd, Tad Dallas, **Grant Foster**, and Robert L. Richards.
Manuscript submitted for publication
- In prep* **Comparing the power of phylogenies, species traits, and network structure to predict plant-frugivore interactions**
Grant Foster and Tad Dallas
Manuscript in Preparation
- In prep.* **Variation in effectiveness of epidemic model parameter estimation with model complexity and data availability**
Robert L. Richards, **Grant Foster**, Bret Elderd and Tad Dallas.
Manuscript in Preparation

Presentations

- May 2024 **Feathers, Fruits, and Functions: Mapping Species Interactions in Brazil & Assessing Data Science Skills in Life Science Classrooms**
Grant Foster, Tad Dallas.
USC Ecology and Evolutionary Biology Seminar. Talk.
- August 2023 **Interaction specificity in assembling mutualist metacommunities with competition-mediated dispersal**
Grant Foster, Tad Dallas.
Ecological Society of America Meeting. Talk.
- April 2023 **Population dynamics of functionally equivalent species: a laboratory experiment of pigmented brewer's yeast (*Sacchromyces cervisia*)**
Grant Foster, Tad Dallas.
USC Discover Day. Poster.
- October 2022 **'Linking' things together: Predicting interactions and assembly dynamics in bipartite mutualist networks.**
Grant Foster, Tad Dallas.
USC Ecology and Evolutionary Biology Seminar. Talk.
- August 2022 **Comparing the power of phylogenies, species traits, and network structure to predict plant-frugivore interactions**
Grant Foster, Tad Dallas.
Ecological Society of America Meeting. Talk.
- June 2021 **Estimating R0 from Early Exponential Growth: Parallels between 1918 Influenza and 2020 SARS-CoV-2 Pandemics**
Grant Foster, Bret Elderd, and Tad Dallas.
Ecology and Evolution of Infectious Disease. Virtual Poster.
- April 2021 **Estimating R0 from Early Exponential Growth: Parallels between 1918 Influenza and 2020 SARS-CoV-2 Pandemics**
Grant Foster, Bret Elderd, and Tad Dallas.
LSU Biology Graduate Student Symposium . Virtual Talk.
- January 2020 **Cestode parasites become more specialist as they ascend host food webs**
Grant Foster, Andrew Park.
Odum School of Ecology Graduate Student Symposium. Poster.

Mentored Student Research Projects

- April 2024 **Estimating how lockdown procedures affected COVID-19 case counts and predicting the case burden due to asymptomatic individuals through continuous time compartmental modeling**
Rebecca Luebke, **Grant Foster**, Tad Dallas.
Presented at USC DiscoverDay.
- April 2024 **Exploring Growth Dynamics: The Potential for Nutrient-Mediated Differences in Growth Rates and Carrying Capacity in a Brewer's Yeast Experimental System**
Baig, Nabeeha, **Grant Foster**, Tad Dallas.
Presented at USC DiscoverDay.

Technical skills and Certifications

Programming languages

Proficient in base **R**, 'tidyverse' suite, as well as classic packages designed for community ecology ('vegan'), phylogenetic analysis ('ape', 'picante'), network analysis ('igraph', 'bipartite'), and spatial analysis ('sf').

Familiar with **Python**

Software

Proficient in \LaTeX , git, GitHub, JAGS, STAN, SoftMax Pro, and ImageJ

Familiar with ArcGIS

Analyses

Proficient in: Machine Learning Approaches, Bayesian Statistical Methods, Multilevel Modeling, Differential Equation Modeling, Matrix-based Compartmental Models

Research experience

Fall Summer
2022 – Present

Graduate Research Project

Mentor: Dr. Tad Dallas (University of South Carolina) Serving as a primary investigator for a project modeling mutualistic network assembly dynamics in a spatial metacommunity context.

Fall 2021 –
Spring 2022

Graduate Research Assistantship

Mentor: Dr. Tad Dallas (Louisiana State University) Served as primary investigator for a project investigating the predictive capabilities of phylogenetic, trait, and latent network trait information for predicting novel plant-frugivore interactions under a machine learning framework.

Fall 2020 –
Spring 2021

Graduate Research Assistantship

Mentor: Dr. Tad Dallas (Louisiana State University) Worked as part of Louisiana State University working group focused on using multi-model approaches to estimate uncertainty and complexity trade-offs in SARS-Cov2 modeling approaches funded under NSF RAPID grant NSF-DEB-2031196.

Spring 2019 –
Spring 2020

Undergraduate Research Assistantship

Mentor: Dr. Andrew Park (University of Georgia) Worked on a variety of projects utilizing parasite-host and mutualist-host databases to investigate factors contributing to parasite phylogenetic host range across species, environments, and developmental stages

Spring 2018

Biology Research Assistant

Mentor: Dr. Bill Fitt (University of Georgia)

Processed coral samples to add to a long-term data set of coral health in reef sites in the Florida Keys, measuring biomass, zooxanthellae density, and Chlorophyll a concentrations

Fall 2018

Independent Ecology Research Project

Mentor: Dr. Amanda Rugenski (University of Georgia)

Compared macroinvertebrate community assemblages of 2 Costa Rican tropical streams with different flow regimes

Honors and scholarships

2023

USC Graduate School Travel Grant

Awarded for travel to Ecological Society of America Meeting (\$500).

2023

Elsie Taber Fellowship (USC)

Awarded for travel to Ecological Society of America Meeting (\$1,964).

2023

BEDE Network Annual Meeting Travel Award

Awarded for travel to attend the 2023 BEDE Network Annual Meeting.

2023

ESIIL Travel Award

Awarded for travel to attend the 2023 ESIIL Innovation Summit (\$1,000).

2022

Elsie Taber Fellowship (USC)

Awarded for travel to Ecological Society of America Meeting (\$2,303).

- 2020 Highest Honors Graduation (University of Georgia)
Awarded for outstanding academic merit and completion of graduate coursework capstone.
- 2019 Thelma Richardson and Frank Golley Undergraduate Support Award (Odum School of Ecology) *Awarded for excellence in undergraduate studies in Ecology (\$1,000).*
- 2016 – 2020 HOPE and Zell B. Miller Scholarship
- 2016 Cherokee County Farm Bureau Scholarship (\$1,000)

Mentorship and service

- Spring 2024 – Present **Technical Committee - Gills Creek Watershed Association**
Part of interdisciplinary committee formed to provide technical advice to the Gill's Creek Watershed Association board and members as well as also to initiate and follow field-oriented projects in the watershed that are important to its restoration and/or conservation.
- Fall 2023 – Present **Service Chair - Graduate Association of Biological Sciences**
Responsible for organizing graduate association outreach, volunteer, and charity events. These include charity drives supporting local communities, stream and park-cleanups, as well as biology education events with local K-12 students.
- March 2024 **USC Region II Science and Engineering Fair Judge (Junior, Senior, and Senior Finalist Judge)**
Judged both junior and senior science fair students from across 9 counties, including serving as a finalist judge for both divisions.
- March 2024 **Crayton Middle School Science and Engineering Fair Judge**
Judged 6th-8th grade individual and group science fair projects
- March 2023 **USC Region II Science and Engineering Fair Judge (Junior and Senior Divisions Judge)**
Judged both junior and senior science fair students from across 9 counties
- Fall 2022 **Family Day Volunteer**
Guided tours of undergraduates and their families across USC Biology research labs, collections, and courses.
- Spring 2021 – Fall 2021 **LSU Biology CodeFest & Makerspace Volunteer**
Volunteered in series of bi-monthly events helping facilitate standalone projects for Biology undergraduate and graduate students to build data analysis and hardware skills.
- Fall 2019 **Ecology Undergraduate Mentorship Program (Founding Organizer)**
Founded an undergraduate peer-mentorship program within the Odum School of Ecology, connecting students new to the school with Junior and Seniors with similar interests and goals • Matched a total of 32 undergraduate mentees with 23 undergraduate mentors • Organized mentorship program kickoff event to introduce mentors and mentees, as well as connect mentees with other students participating in the program
- Spring 2018 – Fall 2019 **UGA EcoReach (Member)**
Participated in ecological outreach programs for middle and highschool students in Athens, GA by partnering with local schools and libraries

Professional Meeting Attendance

- June 2023 **BEDE Network Annual Meeting**
A NSF Research Coordination Network, Biological and Environmental Data Education (BEDE) Network's main objective is to support instructors as they integrate data science skills across undergraduate biology and environmental science curricula, through instructor training, curricular maps, and a network of supportive colleagues.

May 2023

ESIL Innovation Summit

The Environmental Data Science Innovation & Inclusion Lab (ESIL) is an NSF-funded data synthesis center and aims to enable a global community of environmental data scientists to leverage the wealth of environmental data and emerging analytics to develop science-based solutions to solve pressing challenges in biology and other environmental sciences.

June 2022

Ecology of Emerging Infectious Diseases Conference

Recreational Naturalism

In addition to my research and teaching, I've enjoyed getting outside and learning to identify the flora and fauna I encounter in the Southeast, particularly birds!

While studying at USC, I've used ebird to log 150+ bird checklists in South Carolina, and have logged 120 species (and counting) in Richland County alone! Check out my account at ebird.com

I'm also a bit of a iNat addict, and have identified over 5,000 records from across the Southeastern US. Connect with me on [iNat here!](#)