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.

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.*

Publications

In prep. **Comparing Waves of COVID-19 in the US: Scale of response changes over time**
Robert L. Richards, **Grant Foster**, Bret Elderd 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

2022 **Epidemic time series similarity is related to geographic distance and age structure**
Tad Dallas, **Grant Foster**, Robert L. Richards, and Bret Elderd.
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 Elderd, 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

Presentations

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.

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 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 Assistant**
Mentor: Dr. Amanda Rugenski (University of Georgia)
Compared macroinvertebrate community assemblages of 2 Costa Rican tropical streams with different flow regimes

Teaching experience

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.

Spring 2023 **TA, Ecology and Evolution Laboratory (University of South Carolina)**
Supervisor: Dr. Trey Franklin

Fall 2022 **TA, Principles of Biology II Laboratory (University of South Carolina)**
Supervisor: Dr. Eilea Knotts

May 2019 **TA, Tropical Marine Invertebrates (Univeristy of Georgia)**
Supervisor: Dr. Bill Fitt (University of Georgia)
Served as TA for undergraduate summer field course "Tropical Marine Invertebrates and Ecosystems" at Key Largo Marine Lab in Southern Florida

Spring 2019 **TA, Ecological Basis of Environmental Issues (University of Georgia)**
Supervisor: Dan Hawkins (University of Georgia)
Co-taught two undergraduate laboratory sections of 24 students

Honors and scholarships

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)

Pedagogical Training

Awarded Spring 2023 Certificate: Fostering Proactive Learning Environments Certificate
USC Center for Teaching Excellence
Participated in a series of six seminars (8hrs) united under themes of proactive are 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.

November 2022 — USC Suicide Prevention Gatekeeper Training
USC Student Health Services
4hr seminar aimed at helping faculty recognize suicide risks and gain confidence in how to respond to them.

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

Mentorship and service

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

Field experience

November 2017 — **The Leatherback Trust (Field Station Volunteer)** – Guardia, Costa Riva
Supervisor: Francisco Javier Lòpez Navas
Volunteered as part of a small research team to monitor nesting behaviors of 3 species of Pacific sea turtles over the course of 1 month

May 2017 — **Tropical Marine Invertebrates Field Course (University of Georgia)**
Instructor: Dr. Bill Fitt (University of Georgia)
Established shallow-water transects, recorded percent cover of sessile organisms, and collected and water and invertebrate samples in water ranging from 3 to 12 feet in depth.

Spring 2017 — **Evaluation of Environmental Stressors on Jekyll Island Maritime Forests (Volunteer)**
Supervisor: Dr. Lisa King (University of Georgia)
Worked with a small team over a course of 9 field days to establish experimental plots in temperate maritime forest as part of a project looking at the effects of stressors such as herbivory, fire suppression, hurricane damage, on forest characteristics