UNIVERSITY OF CALIFORNIA, DAVIS
Robert Furrow, Ph.D.
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Education

Stanford University
Ph.D. in Ecology and Evolution within the Department of Biology. 2009-2014.
Harvard College
Cum laude B.A. in Mathematics with minor in Organismic and Evolutionary Biology. 2003-2007.

Teaching Experience

Quantitative Biology Education Postdoc, 2018-present, University of California, Davis
Teaching Postdoc, 2015-2018, Stanford Thinking Matters Program
Adjunct Professor, 2014-2015, San José State University (SJSU) Biology Department
Teaching Assistant, 2010-2013, 2005, Stanford Biology Department, Harvard Math Department

Taught as instructor of record for courses in statistics for ecologists, biostatistics, cryptography and Bayesian statistics (1st-year undergraduates), neuroscience (1st-year), epidemiology (1st-year), cancer and society (1st-year), and evolution (non-majors). Taught as TA for courses in honors multivariable calculus and linear algebra, modeling evolution, biostatistics, human behavioral biology, and introductory ecology and evolution.

Currently teaching a bioinformatics course-based undergraduate research experience with a focus on quantitative analyses of genomic data, using individual mentorship and student ownership of research ideas to build students' quantitative biology self-efficacy. Previous teaching at Stanford focused on building critical thinking skills by applying active learning approaches using writing, discussion, and student-led instruction.

Curriculum Design, Support, and Analysis

Quantitative Biology Education Postdoc, 2018-present, University of California, Davis
Designing and implementing curricula for quantitative course-based undergraduate experiences (CUREs), focusing on inclusive teaching practices. Creating quantitative modules to incorporate into laboratory-focused CUREs. Revising curricula for inquiry-based neurobiology labs to promote effective student learning of experimental design. Advised by Professor Mark Goldman. Some preliminary course materials are here: https://davisqbio.github.io/r_intro/

Program Assessment Postdoc, 2015-2016, Stanford Vice Provost for Undergraduate Education
Worked with Elizabeth Hadly, Associate Vice Provost for Undergraduate Education, to assess how the undergraduate population participated in 1st-year seminars, overseas studies, undergraduate research programs, and advising. Collaborated with and presented analyses to program directors to identify approaches to broadening student participation.

Curriculum Design Fellow, 2014-2015, Stanford Biology Department
Collaborated with Ecology and Evolution (EcoEvo) faculty to assess and propose improvements to the EcoEvo undergraduate curriculum. Synthesized data from syllabi, faculty surveys, and student focus groups to propose curriculum revisions to increase opportunities for student research, quantitative training, and immersive field opportunities while promoting a more interactive community of EcoEvo undergraduates, PhD students, postdocs, and faculty.

TA Mentor, 2011-2013, Stanford Biology Department
Mentored and observed new introductory biology TAs.

Research Experience

Quantitative Biology Education Postdoc, 2018-present, University of California, Davis
Performing biology education research on the role of inquiry-based laboratory courses in building student experimental design skills; studying student values, confidence, and anxiety around using math in biology; and designing introductory quantitative biology research courses. Advised by Professor Mark Goldman.

PhD in Biology, 2009-2014, Stanford Biology Department
Earned a PhD in Biology in the Ecology and Evolution group. Developed evolutionary models to analyze the role of epigenetic mechanisms and cultural traits in adaptation. Derived statistical formulas to characterize patterns of non-genetic inheritance, and used permutation testing to evaluate experimental effects of temperature and CO2 on plant communication in collaboration with field ecologists. Advised by Professor Marcus Feldman

Academic Publications and Presentations

Journal Articles

Furrow RE, Price RM, Yin Y, Thomas A, and Bernot KM. Synthesizing and Communicating Experiments: An Instructional Activity and Assessment. *In prep. for submission to CourseSource.*

Furrow RE. 2019. Regression to the Mean in Pre-Post Testing: Using Simulations and Permutations to Develop Null Expectations. *CBE – Life Sciences Education.*

Furrow* RE and Hsu* JL. 2019. Concept Inventories as a Resource for Teaching Evolution. *Evolution: Education and Outreach*. ***Both authors contributed equally to this work.***

Oster M, Beck JJ, **Furrow RE,** Yeung K, and Field CB. 2015. In-Field Yellow Starthistle (Centaurea solstitialis) volatile composition under elevated temperature and CO2 and implications for future control. *Chemoecology.*

Carja* O, and **Furrow* RE,** and Feldman MW. 2014. The Role of Migration in the Evolution of Phenotypic Switching. *Proceedings of the Royal Society B.* ***Both authors contributed equally to this work.***

Furrow RE. 2014. Epigenetic Inheritance, Epimutation, and the Response to Selection. *PLOS ONE.*
Furrow RE and Feldman MW. 2013. Genetic Variation and the Evolution of Epigenetic Regulation. *Evolution.*
Furrow RE, Christiansen FB, and Feldman MW. 2011. Environment-sensitive Epigenetics and the Heritability of Complex Diseases. *Genetics*.

Book Chapters
Furrow RE, Christiansen FB, and Feldman MW. 2013. Epigenetic Variation, Phenotypic Heritability, and Evolution. In C. Greenwood and A.K. Naumova (Eds.), *Epigenetics and Complex Traits*. Springer.

Presentations
Furrow RE, Nord AS, and Goldman MG. 2019. *Genome Hunters: A Quantitative Biology Course-Based Undergraduate Research Experience.* Poster at Gordon Research Conference on Undergraduate Biology Education Research.
Furrow RE. 2013. *Epigenetic Variation and the Response to Selection*. Talk at Evolution 2013.
Furrow RE, Christiansen FB, and Feldman MW. 2011. *Environment-sensitive Epigenetics and the Heritability of Complex Diseases*. Poster at European Science Foundation Symposium.
Furrow RE, Izem R, and Wolfe P. 2008. *Bird Song and Principal Components Analysis*. Poster at Evolution 2008.

Mentoring and Service

Abstract Reviewer for the annual Society for the Advancement of Biology Education Research (SABER) conference, 2019.
Reviewer for the monthly peer-reviewed journals *American Naturalist, Genetics,* and *Theoretical Population Genetics*, 2011-present.
Board member for Sequoia Audubon Society. Designing and implementing field trips and fundraisers to promote conservation and nature education, 2015-2018.
Docent teaching natural history to disadvantaged elementary school students, 2013-2016.
Student host for prospective PhD students during Stanford Biosciences interviews, 2010-2014.
Student mentor for incoming 1st year graduate students adjusting to campus life, 2010-2014.

Awards and Training

SEPAL Scientific Teaching Summer Institute Participant, 2017. Participated in a weeklong training in cutting-edge practices for assessment, inclusion, and active learning in biology, conducted by SEPAL (the Science Education Partnership and Assessment Laboratory at SF State University).
Stanford Preparing Future Professors Fellow, 2014. Mentored by Dr. Leslee Parr at SJSU.
Outstanding Teaching Assistant nominee, 2013. One of four nominees within Stanford Biosciences (of 700 graduate students).
Excellence in Teaching Award, 2011. Stanford departmental award based on student feedback.