

Tyler Poppenwimer

tlpoppy@outlook.com

tpoppenw@vols.utk.edu

<http://tpoppenwimer.weebly.com>

Address:

7324 Sir Walter Way, Apt 5303
Knoxville, TN, 37919
(717) 830 5537

Campus Address:

1404 Circle Drive
Knoxville, TN, 37920
(717) 830 5537

RESEARCH FOCUS:

My chief focus is trying to determine how below ground communities and their dynamics (the interactions between mycorrhizae, bacteria, roots, nutrients and soil type) interact with above ground communities and their dynamics (plant communities, but potentially expanding to herbivores and or pollinators) and how these dynamics and communities can change over time and along environmental gradients. I am developing a theoretical framework useful for analysis of the spatio-temporal dynamics of plant communities that is amenable to evaluation through comparisons with diverse datasets. I have begun working collaboratively and individually to develop these models where they utilize dynamical systems, stochastic processes, and individual based modelling.

PUBLICATIONS:

Poppenwimer T., Hicks H., K. Boes, and P. Nyamai. 2015. Promoting student understanding of the ecological impacts and management of invasive species: a collaborative scenario-driven activity. *American Biology Teacher*, pp. 670-680.

Poppenwimer T. When should flowering specialize or generalize? A spatially explicit agent-based modelling approach to determine the conditions under which specialization or generalization is favoured (in progress).

EDUCATION:

The University of Tennessee Knoxville, Knoxville, TN

Aug 2014 - present

PhD Candidate: Ecology and Evolutionary Biology

GPA: 4.0

Advised by Dr. Louis Gross, Direction of the National Institute for Mathematical and Biological Synthesis, and co-advised by Dr. Joseph Bailey, Associate Professor. Planned masters in statistics.

The College of Wooster, Wooster, OH

Bachelor of Arts: May 2014

Double Major: Mathematics and Biology

GPA: 3.329

Senior Independent Study: Generalist and Specialist Pollination Syndromes: When are they Favoured? Yearlong research project culminating in two working mathematical models, 120 page paper, 90 minute oral defense, and 15 minute community presentation. Awarded Honours in the Mathematics and Biology Departments.

School for International Training, Cairns, Queensland, Australia

Aug 2012 - Dec 2012

Off Campus Study

GPA: 3.89

Intensive study abroad program focusing on three hands-on modules: rainforest, reef, and cultural.

- Developed the skills to accurately assess flora, fauna, and environmental conditions in terrestrial and marine ecosystems.
- Learned aboriginal culture, history, and heritage during a two week camping trip led by aboriginal elders.
- Worked with and learned from professional researchers at a rainforest and a marine research station.
- Spent two weeks on Lizard Island Research Station; a marine research laboratory run by the Australian Museum.

CLASSES:

Computational Bayesian Statistics I & II:	An application approach to understanding and utilizing Bayesian Statistics. Utilized WinBugs, MATLAB, and Mathematica to develop Bayesian frameworks.
Mathematical Evolutionary Theory:	A theory approach to understand the fundamental mathematical models describing evolutionary phenomena and their most recent expansions.
Probability and Mathematical Statistics I	A model creation approach to applying model selection, Bayesian frameworks, information criteria, and various statistical algorithms to real world data.
Mathematical Ecology I & II:	An exploration of the fundamental ecological mathematical models
Applied Time Series Analysis	An application approach to understand Bayesian, frequentist, and model selection techniques for analyzing time series data using MATLAB
Advanced Mathematical Ecology I	An examination of multiple methods of model analysis (bifurcation, PCA, Sensitivity analysis, etc.) using numerous programs

RESEARCH EXPERIENCE WITHIN GRADUATE SCHOOL

A CA Model to Examine the Spread of Gun Violence. A collaborative project using cellular automata and simple disease SEIR models to predict the spread of gun violence using publically available crime data from Chicago.

A Finite Guassian Mixture Model of Bounded mRNA. A project to develop a finite Gaussian mixture model from absorbance profile gene expression data to study a dynamic model of mRNA and ribosome populations.

Square Grids Skew Euclidian Distance. A project to understand the effects of varying topological grid types on the stability and dynamics of simple stochastic cellular automata games.

WORK EPXERIENCE

Graduate Teaching Assistant: Instructor of Record Spring 16 & Fall 16
The University of Tennessee Knoxville, Knoxville, TN Math for the Life Sciences I & II

- Full instructor and grader for Math 151 section 1 (~25 students) and Math 152 sections 1 & 2 (~50 students)
- Develop class syllabus detailing class goals, protocols, grading scheme, expectations, and tentative schedule
- Produce class lectures using PowerPoint, examples, in class activities, and real world problems to illustrate the material
- Create homework, quizzes, and exams to accurately assess student knowledge of the topic
- Develop unique projects applying taught mathematical and MATLAB methods to real world problems with data
- Showcase examples from my research and the literature that use methods similar to those taught in class

Graduate Teaching Assistant: Recitation Instructor Fall 14/15 & Spring 15
The University of Tennessee Knoxville, Knoxville, TN Math for the Life Sciences I & II

- Instructed two recitations for Math 151 (~70 students)
- Taught varying level of mathematics needed to examine biological phenomena
- Demonstrated proper use of MATLAB through example m-files and programming with student participation.

RESEARCH EXPERIENCE PRIOR TO GRADUATE SCHOOL:

R/V Marcus G. Langseth, Lamont Doherty, Columbia University May 2013 – Jul 2013
Marine Advanced Technology and Education Technical Intern
Collected seismic data in Atlantic Ocean, west of Spain while onboard the R/V Marcus G. Langseth. Data was used to image faults under the seafloor that were involved in continental rifting and initial opening of Atlantic Ocean ~125 mya.

- Provided support for a wide range of electronic and electromechanical equipment.
- Participated in the deployment and recovery of research equipment.
- Board level troubleshooting for electronics and mechanical components.
- Conducted MGG physical, water, and acoustic Doppler current profiler sampling.

Independent Study Project, James Cook University, Townsville, Australia Nov 2012- Dec 2012
Studied under established researcher, Dr. Sean Connolly member of the Ecological Modelling Research Group.

- Explored game theory and the applications of game theory in evolutionary and ecological biology.
- Worked with PhD candidates to develop a mathematical model in MatLab.
- Conducted simulation modeling to explore the effects of stochasticity on general 2 by 2 frequency dependent games.
- Resulted in a working mathematical model, a 55 page report, and an oral presentation.

Reef Ecosystem Study, Lizard Island Research Station, QLD, Australia Oct 2012
Examined the effects of varying coral cover on fish populations and fish behavior in the Great Barrier Reef.

- Sampled and observed fish populations and behaviors, conducted twenty, five minute observation periods.
- Coral cover was determined by site sampling 100m tracks at 12 different locations around Lizard Island.

SKILLS/INTEREST

Extensive use and knowledge of MATLAB: Advanced GUI development, analysis toolbox, data analytics, figure production, and function development.	Superior knowledge of DIY construction projects: wood, metal, and electrical.
Strong use and knowledge of JAVA, NetLogo, R, Mathematica, and LaTeX.	Above average knowledge of tools and home construction equipment.
Exceptional knowledge of Microsoft Office Suite Programs	Lived in the United Kingdom for 16 years.
Excellent troubleshooting skills for Windows OS	Visited 86 different countries: exploring cultural, natural, and historical sites.