

Dr. JING JIAO

Research Associate

NIMBioS, University of Tennessee,

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EDUCATION

Ph.D. University of Florida, Gainesville, FL	2011-2017
Major: Zoology	GPA: (3.84/4.00)
Minor: Statistics	
M.S. East China Normal University, Shanghai, China	2008-2011
Major: Ecology	GPA: (3.78/4.00)
B.S. East China Normal University, Shanghai, China	2004-2008
Major: Statistics	GPA: (3.30/4.00)

RESEARCH INTEREST

Theoretical biology: applying mathematical dynamic model to biological conservation:

- Effects of predation, competition and resource limitation in marine systems
- Migration effects on predator-prey and host-pathogen interactions at behavioral, demographical and evolutionary scales

Data analysis: using R language to do data analysis:

- Experimental design
- Linear regression, ANOVA, MCMC, Bayesian analysis
- State-space model

PUBLICATIONS (* = a mentored undergraduate student)

1. Marino Jr, J.A., SD. Peacor, DB, Bunnell, HA, Vanderploeg, SA, Pothoven, AK, Elgin, JR. Bence, **J Jiao** and EL. Ionides (2019). Evaluating consumptive and nonconsumptive predator effects on prey density using field time-series data. *Ecology*, 100(3): e02583.
2. **Jiao, J.**, SS. Pilyugin, L. Riotte-Lambert and CW. Osenberg (2018). Habitat-dependent movement rate can determine the efficacy of marine protected areas. *Ecology*, 99(11): 2485-2495.
3. **Jiao, J.**, SS. Pilyugin and CW. Osenberg (2016). Random movement of predators can eliminate trophic cascades in marine protected areas. *Ecosphere*, 7(8): e01421.
4. Gil, MA., **J Jiao** and CW. Osenberg (2015). Enrichment scale determines herbivore control of primary producers. *Oecologia* 180:833-840.
5. Wang, XY, DW Shen, **J Jiao**, NN Xu, S Yu, XF Zhou, MM Shi and XY Chen (2012). Genotypic diversity enhances invasive ability of *Spartina alterniflora*. *Molecular Ecology* 21:2542-2551.
6. Chen, XY, **J Jiao** and X Tong (2011). A generalized model of island biogeography. *Science China: Life Science*, 54: 1055-1061.

7. Li, JH, **J Jiao**, K Jiang and YY Li (2011). Development and characterization of microsatellites in *Torreya JackII* (Taxaceae), an endangered species in China. *American Journal of Botany*, 98:e349-e351.
8. **Jiao, J**, JJ Guan and YH Xie (2010). Conference Review: The 2nd Chinese R Conference. *The R Journal*, 2: 60-61.
9. Yang, SZ, Y Ma, P Jiang, **J Jiao**, YF Zhu, MS Zhao and XY Chen (2009). Soil physical and chemical properties along altitudes of Western Tianmushan. *Journal of East China Normal University*, 6:101-107.
10. **Jiao, J.**, SS. Pilyugin, MA. Gil and CW. Osenberg. Mobility and its sensitivity to fitness differences determine consumer-resource distributions. (under review)
11. **Jiao, J.**, M. Gilchrist, N. Fefferman. The influences of host evolution on host-pathogen interactions across space. (under review)
12. **Jiao, J.** N. Fefferman. A transient disease cycles in host-pathogen interactions when host migrate among patches. (In prep.)
13. Grandison, B.*, H. Yin*, A. Kilgore*, **J. Jiao** and N. Fefferman. Severity of an epidemic alters timescales of disease-driven evolutionary rescue with immune-reproductive tradeoffs modeled from a game theoretic perspective. (in prep.)

EXPERIENCE

Research Associate, University of Tennessee, Knoxville, TN Sept.10, 2018~

- Assist two projects modeling disease transmission in a system with evolved hosts but constant pathogen strain with and without host recovery
 - Built disease transmission models and simulated the models in both Matlab and R
 - Analyzed the model results and I am writing two related manuscripts
- Lead one project understanding Division of Labor across scales
 - Came up with the idea
 - Arranged the agenda of project process
 - Collaborating with other lab members
- Helped to host one NIMBioS activity –A tasting Menu of Mathematical Models

Teacher and mentor, University of Tennessee, Knoxville, TN Feb. 2019 ~ Aug. 2019

- Designed and lectured one undergraduate class—Evolution, Disease and Medicine
 - Lectured and led the discussion of each class
 - Graded quizzes, exams and guided projects for each student
- Mentored three undergraduate students during NIMBioS Summer Research Experiences (SRE) program
 - Guided students to develop solid scientific hypothesis
 - Provided methodology support
 - Kept up with the project process through weekly meeting

Research Associate, Michigan State University, East Lansing, MI Sept. 5, 2017-Sept. 4, 2018

- Assisted a project applying state-space models to analyze the influences of biotic and abiotic factors on one dominant zooplankton species *Daphnia mendotae* in Great Lake Systems
 - Designed and performed model building, testing and evaluation

- Database management and organization for 16-year time-series data including the change of *Daphnia* biomass density, invasive species biomass density, temperature change, light change etc.
- Led a project comparing the applications of two R packages analyzing state-space models—Partial Observed Markov Process (POMP) and Template Model Builder (TMB)
 - Organized data across ecological systems to fit state-space model structure
 - Analyzed and evaluated both POMP and TMB given ecological data

Mathematic and statistic modeler, University of Florida, Gainesville, FL Sept. 2011-May, 2017

- Chaired and designed three projects utilizing Ordinary Differential Equations (ODEs) to determine the influences of dynamical flow of fish on the efficiency of marine reserve
 - Designed spatial-implicit models to analytically solve and numerically simulate the dynamics of spatial-discrete but temporal-continue marine systems
 - Evaluated the marine conservations given different animal movement strategies
- Consulted on NSF interdisciplinary project (QSE3 IGERT) applying hierarchical models in order to analyze shrimp distributions in the Gulf of Mexico in full collaboration with the United States Federal Fishery Agency (NOAA)
 - Participated in the building of multiple-species occupancy model of three shrimp species to understand shrimp distribution
 - Built age-structured shrimp dynamic model to understand the influences of nursery habitats on shrimp abundances

Teaching Assistant, University of Florida, Gainesville, FL Aug. 2012-Dec. 2016

- Designed, organized and taught one general biology lab (more than 300 undergraduate students across multiple disciplines)
 - Lectured basic biological sections such as plant and animal anatomy, species interactions and distributions
 - Led individual project designs for understanding the influences of spatial and temporal factors on species interactions

Data Analyst, East China Normal University Aug. 2008-June, 2011

- Participated in a project utilizing Monte Carlo Simulations to test the influences of genetic diversity on the invasive ability of species: *Spartina alterniflora*
 - Designed and performed permutation test to differentiate the influences of genotype on *Spartina* production
- Assisted on a project implementing Bayesian Analysis in order to determine the appropriate quadrat size using the big dataset of forests on Barro Colorado Island
 - Used Winbugs to test the efficacy of quadrat sizes for evaluating species-area relationships

PRESENTATIONS

1. **Jiao, J.**, M. Gilchrist, N. Fefferman. *The influences of host evolution on host-pathogen interactions across space*. **2019 Annual Meeting and Conference of the Society for Mathematical Biology**, Montreal, CA July 22-26, 2019
2. **Jiao, J.**, SD. Peacor, JA Marino, Jr., J. Bence, DB. Bunnell, HA. Vanderploeg, SA. Pothoven, AK. Elgin and EL. Ionides. *Temperature influences the consumptive and non-consumptive effects*

- of predators on zooplankton production in the Great Lakes. 103th Annual Meeting of the Ecological Society of America, New Orleans, Louisiana, USA* Aug. 5-10, 2018
3. **Jiao, J.**, SS. Pilyugin, MA. Gil and CW. Osenberg. *Mobility determines consumer resource interactions across space and time. 101th Annual Meeting of the Ecological Society of America, Fort Lauderdale, Florida, USA.* Aug. 7-12, 2016
 4. **Jiao, J.**, SS. Pilyugin, MA. Gil and CW. Osenberg. *Mobility determines consumer resource interactions across space and time. Gordon Research Conference “Unifying Ecology Across Scales”, Biddeford, Maine, USA.* July 24-29, 2016
 5. **Jiao, J.**, SS. Pilyugin, and CW. Osenberg. *Movement reverses trophic cascades in marine reserves. North Florida Marine Science Symposium, St. Augustine, Jacksonville, Florida, USA.* Jan. 16-17, 2014
 6. **Jiao, J.**, SS. Pilyugin, and CW. Osenberg. *Movement reverses trophic cascades in marine reserves. Gordon Research Conference “Predator-Prey Interactions”, Ventura, California, USA.* Jan. 5-10, 2014
 7. **Jiao, J.**, J. Langebrake, L. Riotte-Lambert and CW. Osenberg *Differential movement of harvested organisms affects predicted responses to Marine Protected Areas. 42th benthic conference, Savanna, Georgia, USA.* Mar. 20-24, 2013

AWARDS AND RECOGNIZATIONS

1. **Jiao, J.**, SS. Pilyugin, MA. Gil and CW. Osenberg. *Mobility determines consumer resource 1.* Charles Vincent and Heidi Cole McLaughlin Endowment Dissertation Fellowships, Department of Biology, University of Florida Jan., 2017
2. **QSE3 IGERT**¹interdisciplinary research funding, Department of Mathematics, University of Florida Oct., 2015-May, 2016
3. **QSE3 IGERT** interdisciplinary research funding, Department of Biology, University of Florida Aug., 2011-May, 2012
4. Outstanding Achievement Certificate, University of Florida International Center (UFIC), University of Florida Dec., 2012

¹ **QSE3 IGERT** (DGE-0801544) is an *interdisciplinary* program, including PhD graduate students from biology, statistics, mathematics, fishery, geography and wildlife ecology etc.