

# T. TREVOR CAUGHLIN

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## Professional Appointments

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**NSF Postdoctoral Fellow** (2014-present) *Science, Engineering and Education for Sustainability (SEES) program.*

Stephanie Bohlman, School of Forest Resources & Conservation, University of Florida.

**Postdoctoral Research Associate** (2013-2014) *Scaling up tropical forest dynamics using mathematical models and remote sensing data.*

Jeremy Lichstein, Department of Biology, University of Florida.

**Lecturer** (2013-2014) *Taught Integrated Principles of Biology II and General Ecology courses. Developed course materials, supervised Teaching Assistants, and gave lectures.*  
Department of Biology, University of Florida.

**Research Associate** (2008-2013) *Mentored Thai graduate students, provided statistical training, and advised on quantitative techniques in ecology.*

King Mongkut's University of Technology-Thonburi, Thailand.

**NSF IGERT Fellow** (2009-2013) *Quantitative Spatial Ecology, Evolution and the Environment.* Departments of Biology, Mathematics, Wildlife Ecology & Conservation.  
University of Florida.

## Education

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**Ph.D. in Biology** (2013) *Seeds move but trees stand still: spatial population dynamics of tropical trees*

Douglas Levey, Department of Biology, University of Florida.

**Bachelor of Arts in Environmental Studies and Biology** (2007) *Birds and bats as agents for reforestation in an anthropogenic landscape of South India*

Margaret Lowman, Environmental Studies, New College of Florida.

## Research and Teaching Interests

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Forest landscape restoration, Spatial ecology, Seed dispersal, Landscape ecology, Remote sensing, Statistical methods in ecology, Tropical forests, Human ecology, Transdisciplinary research

## Publications

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**Caughlin T.T.**, S.W. Rifai, S.J. Graves, G.P. Asner, S.A. Bohlman. Landsat-LiDAR integration reveals widespread forest regrowth in a tropical agricultural landscape. *Remote Sensing in Ecology and Conservation* In Press.

**Caughlin T.T.**, S.J. Graves, G.P. Asner, M. van Breugel, J.S. Hal, R.E. Martin, M.S. Ashton, S.A. Bohlman. A single hyperspectral aerial image can accurately predict growth rates of tropical tree species in single-species stands. *Ecological Applications* In Press.

**Caughlin T.T.**, S. Elliott, J.W. Lichstein. When does seed limitation matter for scaling up reforestation from patches to landscapes? *Ecological Applications* In Press.

Brudvig L.A., R.S. Barak, J.T. Bauer, **T.T. Caughlin**, et al. Interpreting variation to advance predictive restoration science. *Journal of Applied Ecology*. In Press.

Levey D.J., **T.T. Caughlin**, L.A. Brudvig, N.M. Haddad, E.I. Damschen, J.J. Tewksbury, D.M. Evans. (2016). Disentangling fragmentation effects on herbivory in understory plants of longleaf pine savanna. *Ecology* 97:2248-2258.

Ruktanonchai, N. W., P. DeLeenheer, A. J. Tatem, V. A. Alegana, **T. T. Caughlin**, et al. (2016). Identifying malaria transmission foci for elimination using human mobility data. *PLOS Computational Biology* 12:e1004846.

**Caughlin T.T.**, J.M. Ferguson, J.W. Lichstein, P.A. Zuidema, S. Bunyavejchewin, D.J. Levey. (2015). Loss of animal seed dispersal increases extinction risk in a tropical tree species due to pervasive negative density dependence across life stages. *Proceedings of the Royal Society B: Biological Sciences* 282:20142095.  
\*Student Paper Award Honorable Mention, Organization for Tropical Studies.

Acevedo, M. A., O. Prosper, K. Lopiano, N. Ruktanonchai, **T.T. Caughlin**, M. Martcheva, C. W. Osenberg, D. L. Smith. (2015). Spatial heterogeneity, host movement and mosquito-borne disease transmission. *PloS one* 10:e0127552.

Wilson, C. H., **T.T. Caughlin**, D.J. Civitello, S.L. Flory. (2015). Combining mesocosm and field experiments to predict invasive plant performance: a hierarchical Bayesian approach. *Ecology* 96:1084–1092.

**Caughlin T.T.**, J.M. Ferguson, J.W. Lichstein, S. Bunyavejchewin, D.J. Levey. (2014). The importance of long distance seed dispersal for the demography and distribution of a canopy tree species. *Ecology* 95: 952-962.

**Caughlin T.T.**, N. Ruktanonchai, M.A. Acevedo, K. Lopiano, O. Prosper, N. Eagle,

A.J. Tatem. (2013). Geographic context predicts community membership in a mobile phone communication network. *PloS one* 8(2): e56057.

Chanthorn W., **T.T. Caughlin**, S. Dechkla. (2013). Seedling survival of a dominant tropical tree depends on fungal infection, not negative density dependence or environmental heterogeneity. *Biotropica* 45:587-593.

**Caughlin T.T.**, J.H. Wheeler, J.J. Jankowski, J.W. Lichstein. (2012). Urbanized landscapes increase invasive but not native strangler fig abundance. *Ecology* 93:1571-1580.

\*Best Graduate Student Paper Award, University of Florida, Biology Department

**Caughlin T.T.**, T. Ganesh, M.D. Lowman. (2012). Sacred fig trees promote frugivore visitation and tree seedling abundance in South India. *Current Science* 102:1-6.

Callis, K. L., L.R. Christ, J. Resasco, D.W. Armitage, J.D. Ash, **T. T. Caughlin**, et al. (2009). Improving Wikipedia: educational opportunity and professional responsibility. *Trends in Ecology & Evolution* 24:177-179.

## **Publications in Review**

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Roopsind A.R., **T.T Caughlin**, H. Sambhu, J. Fragoso, F.E. Putz. Logging and indigenous hunting impacts on the persistence of large neotropical animals. *Journal of Applied Ecology* In revision

Wilson, C.C., **T.T. Caughlin**, S.W. Rifai, E.H. Boughton, M.C. Mack, L.S. Flory. Long time series of remotely sensed vegetation improves prediction of soil carbon stock in a subtropical grassland. *Ecological Application*. In review.

## **Teaching Experience**

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### *Instructor (courses)*

**Gaming for Ecology, Economics and Complex Systems** (2016) Graduate-level. *Developed and led seminar on games as a tool to involve stakeholders in research across a wide range of fields, including natural resource management, behavioral economics, and complex systems modeling.* 14 students. 1 credit. University of Florida.

**General Ecology** (2014) Upper-level undergraduate course. *Community and population ecology module.* 60 students. 4 credits. University of Florida.

**Integrated Principles of Biology II** (2013) Undergraduate-level. *Introductory course for Biology majors; ecology module.* 700 students. 3 credits. University of Florida.

*Instructor (workshops)*

**Quantitative thinking in ecology** (2016) Graduate-level. *Primer on linking models to ecological data.* 25 students. 1 week. University of Puerto Rico.

**Quantitative analysis of ecological data** (2014) Upper-level undergraduate. *Introduction to biostatistics to assist senior students with analyzing data for their honors theses.* 15 students. 1 week. University of Guyana (with Anand Roopsind).

**Introduction to multivariate regression** (2013) Graduate-level. *Practical skills for analyzing ecological data using R programming language.* 25 students. 2 weeks. King Mongkut's University of Technology-Thonburi, Thailand.

**Generalized linear models in ecology** (2011) Graduate-level. *Course focused on applying statistical models to analyze wildlife data.* 25 students. 2 weeks. King Mongkut's University of Technology-Thonburi, Thailand (with Mollie Brooks, Jake Ferguson and Rosana Zenil).

**Matrix population models** (2010) Graduate-level. *Introduction to structured population models for wildlife students.* 10 students. 1 week. King Mongkut's University of Technology-Thonburi, Thailand (with Mollie Brooks).

**Mathematical models in ecology** (2010) Graduate-level. *Theoretical models for population and community ecology.* 15 students. 1 week. Kasetsart University, Thailand.

**Seed dispersal** (2008) Undergraduate-level. *Field course on methods for studying seed dispersal.* 20 students. 1 week. Khao Yai National Park, Thailand.

## Grants and Fellowships

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*Proposals with Caughlin as PI*

**National Science Foundation: Science, Engineering and Education for Sustainability (SEES) program** (\$350,000; NSF grant #1415297), "Landowner decision-making and landscape-level reforestation," 2014-2018.

**Fulbright Award, Thailand**, (\$30,000) "Survival prospects for Thailand's large-mammal dispersed trees," 2007-2008.

**Sigma Xi Grant-in-Aid of Research** (\$800), "Quantifying the importance of seed dispersal at different spatial scales," 2010.

### *Fellowships*

**National Science Foundation: Graduate Research Fellowship**, (\$120,000; NSF grant #DGE-0802270) “Will animal-dispersed rainforest trees persist without dispersal services?” 2007-2009.

**National Science Foundation: IGERT Fellowship, Quantitative Spatial Ecology**, 2009-2012.

### *Proposals with Caughlin as Senior Personnel*

**National Science Foundation: Dynamics of Coupled Natural and Human Systems (CNH) program** (\$1.6 million; NSF Grant # 1617364) “Land transactions and investments: Impacts on agricultural production, ecosystem services, and food-energy security.” PI: Arun Agarwal. Co-PIs: Dan Brown, Jane Southworth. *Caughlin wrote ecological dynamics and ecology field sampling portions of grant.* 2016-2020.

## **Undergraduate Students Mentored**

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**Gabriella Frankhouser and Orion Morton** (2015) *Took students to Panama for three-week Independent Study Period research on reforestation.* New College of Florida.

**Carlita Fiestas Nunez** (2015-2016) *Quantifying forest change using remote sensing data in Panama.* University of Florida.

**Brendan Regnery** (2014-2015) *Consequences of animal foraging patterns for seed dispersal.* University of Florida.

**Ameet Patel** (2010-2012) Honor’s thesis: *Quantifying negative density dependence across the life stages of the bean beetle, Callosobruchus maculatus.* University of Florida.

**Jessica Wheeler** (2009) Honor’s thesis: *The impact of seed dispersal by mammals on seed fate in a dry evergreen forest, Huai Kha Khaeng Wildlife Sanctuary, Thailand.* (co-supervised with Margaret Lowman) New College of Florida.

## **Professional Service**

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**Literature Coordinator**, (2015-Present). *Produced science outreach blogposts (available at <http://partners-rcn.org/>) on reforestation for NSF-funded Research Coordination Network. PARTNERS (People and Reforestation in the Tropics) network.*

**Symposium organizer**, (2013). *Organized symposium titled “Modeling Coupled Natural-Human Systems in the Tropics.”* Association for Tropical Biology and Conservation Annual Conference, San José, Costa Rica.

**Student representative**, (2010-2011). *Contributed to curriculum development, organizational decisions and planned annual meeting.* Advisory Council, Quantitative

Spatial Ecology, Evolution and the Environment NSF IGERT program, University of Florida.

**Student representative**, (2009-2010). *Led student outreach and web development activities*. Graduate Student Advisory Council, “Innovation, Integration and Institutionalization” NSF-funded graduate training program, University of Florida.

**Intern**, (2006). *Conducted agroecology research, developed environmental outreach activities for local communities*. Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore, India.

**Intern**, (2002-2003). *Developed propagation techniques for aquarium-raised coral species*. Geothermal Aquaculture Research Foundation, Boise, Idaho.

### **Invited Seminars**

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**Spatial models to promote forest landscape restoration in Panama’s Azuero Peninsula** (2016). Caughlin, T.T. Smithsonian Tropical Research Institute, Tupper Talk. Panama City, Panama.

**Spatial models to scale up reforestation from patches to landscapes** (2016). Caughlin, T.T. University of Puerto Rico, Río Pedras Campus. San Juan, PR.

**Quantifying human movement for models of malaria transmission in Hispaniola** (2012). Caughlin, T.T., Ruktanonchai N., Acevedo, M.A., Lopiano K., Prosper, O., Eagle, N., Tatem, A.J. Assessing the Feasibility of Malaria Elimination in Hispaniola, St. Petersburg, FL.

**Seeds move but trees stand still: effects of seed dispersal on tree demography and distribution** (2012). Caughlin, T.T, Chiang Mai University, Thailand.

**Long and short distance seed dispersal in Huai Kha Khaeng Wildlife Sanctuary, Thailand** (2009). Caughlin, T.T. National University of Singapore, Singapore.

### **Contributed presentations** (only presentations on which I’m first author)

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**Hierarchical Bayesian models to quantify forest dynamics at the scale of individual trees from remote sensing data**. (2016). Caughlin, T.T. International Statistical Ecology Conference (Seattle, Washington).

**Non-linear impacts of succession on survival and growth of naturally-recruited tree seedlings during tropical forest restoration**. (2016). Caughlin, T.T. M. De la Peña-Domene. Ecological Society of America Annual Meeting (Ft. Lauderdale, FL).

**Using spatial models to link landowner decision-making with tropical forest**

**dynamics and promote landscape-level reforestation.** (2016). Caughlin, T.T. Yale International Society of Tropical Foresters conference on Tropical Forests for Sustainable Development (New Haven, CT).

**Seed dispersal and the transient dynamics of reforestation in heterogeneous landscapes.** (2015). Caughlin, T.T., S. Elliott, J.W. Lichstein. Ecological Society of America Annual Meeting (Baltimore, Maryland).

**Sensitivity of population growth rates of a tropical tree species to conspecific neighborhood competition at multiple life stages.** (2013). Caughlin, T.T., J.M. Ferguson., P.A. Zuidema, D.J. Levey, S. Bunyavejchewin, J.W. Lichstein. Association for Tropical Biology and Conservation Annual Conference (San Jose, Costa Rica).

**Inferring long distance seed dispersal from seedling count data: a hierarchical Bayesian approach.** (2013). Caughlin, T.T., Ferguson J.M., Levey, D.J., Bunyavejchewin S., Lichstein J.W. Ecological Society of America Annual Meeting (Minneapolis, Minnesota).

**Geographic context and community membership in a Dominican social network.** (2012). Caughlin T.T., Ruktanonchai N., Acevedo M.A., Lopiano K., Prosper O., Eagle N., Tatem A.J. IGERT video & poster competition. Presentation available online at: <http://posterhall.org/igert2012/posters/294> (Washington, D.C.).

\*Received Judge's Choice Award

**Consequences of long distance seed dispersal for the seedling bank at the Huai Kha Khaeng Wildlife Sanctuary.** (2012). Caughlin, T.T. Association for Tropical Biology and Conservation-Asia Chapter Annual Conference (Xishuangbanna, China).

\*Received Award for Best Student Oral Presentation

**Giant fruit bats and birds as agents for reforestation in South India.** Caughlin, T.T., Ganesh T., Lowman M.D. (2007). Ecological Society of America Annual Conference (San Jose, CA).

## **Professional Reviewer**

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Ecology, Environmental Entomology, Biotropica, Ecological Modelling, Integrative Zoology, Journal of Applied Ecology, Biological Conservation, National Science Foundation, Nature Communications