T. TREVOR CAUGHLIN

Assistant Professor, Department of Biological Sciences, Boise State University
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Professional Appointments

Assistant Professor (2016-present) Department of Biological Sciences, Boise State University.

NSF Postdoctoral Fellow (2014-2017) *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

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

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

Publications

Roopsind A.R., **T.T Caughlin,** H. Sambhu, J. Fragoso, F.E. Putz (2017). Logging and indigenous hunting impacts on the persistence of large neotropical animals. *Biotropica* 49: 565-575.

Wilson, C.C., **T.T. Caughlin,** S.W. Rifai, E,H. Boughton, M.C. Mack, L.S. Flory (2017). Long time series of remotely sensed vegetation improves prediction of soil carbon stock in a subtropical grassland. *Ecological Applications* 27: 1646-1656.

Brudvig L.A., R.S. Barak, J.T. Bauer, **T.T. Caughlin**, et al (2017). Interpreting variation to advance predictive restoration science. *Journal of Applied Ecology* 54: 1018:1027.

Caughlin T.T., S.W. Rifai, S.J. Graves, G.P. Asner, S.A. Bohlman (2016). Landsat-LiDAR integration reveals widespread forest regrowth in a tropical agricultural landscape. *Remote Sensing in Ecology and Conservation* 2:190-203.

Caughlin T.T., S.J. Graves, G.P. Asner, M. van Breugel, J.S. Hal, R.E. Martin, M.S. Ashton, S.A. Bohlman (2016). A single hyperspectral aerial image can accurately predict growth rates of tropical tree species in single-species stands. *Ecological Applications* 26:2367-2373.

Caughlin T.T., S. Elliott, J.W. Lichstein (2016). When does seed limitation matter for scaling up reforestation from patches to landscapes? *Ecological Applications* 26:2437-2448.

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.

Teaching Experience

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

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

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

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

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)

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 Wildilife 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

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