

ANDREW M. KRAMER
Curriculum Vitae

Address: Department of Integrative Biology
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EDUCATION

- Ph.D. in Fisheries and Wildlife / Ecology, Evolutionary Biology and Behavior (dual degree), 2007, Michigan State University. Advisor: Orlando Sarnelle
- Bachelor of Science, 2000, Saint Louis University, Honors degree, Biology (summa cum laude)

ACADEMIC APPOINTMENTS

- Assistant Professor, Department of Integrative Biology, University of South Florida, Jan. 2018 – present.
- *Assistant Research Scientist*, Odum School of Ecology, University of Georgia, Aug. 2013 – Dec. 2017. Member of the Graduate Faculty.
- *Postdoctoral researcher*, Odum School of Ecology, University of Georgia, Sept. 2009 – April 2013. Mentor: Dr. John Drake
- *Instructor*, Department of Biology, Gainesville State College, Georgia, Summer 2009.
- *Postdoctoral researcher*, Odum School of Ecology, University of Georgia, Oct. 2007-March 2009. Mentor: Dr. John Drake

GRANTS AND AWARDS

- *National Science Foundation, Macrosystems Biology*, “Multi-scale dynamics of white-nose syndrome in North America”, 2015-2019. **PI: Kramer, A.**, co-PI: Drake, J.M. (\$291,000)
- *Edward and Phyllis Reed Endowment*, “Pheromone specificity between closely and distantly related species in the genus *Hesperodiaptomus*”. 2010. (**Kramer co-PI**, collaborative with Jeannette Yen, Georgia Institute of Technology, \$5900).
- *Valentine/Eastern Sierra Reserve Graduate Student Grant*, University of California Reserve System, 2006 (\$1500)
- *Sigma Xi Grant-in-Aid of Research*, 2006 (\$580)
- *National Science Foundation Graduate Research Fellowship*, 2001-2005 (~\$100,000)
- *Research Experience for Undergraduates Supplement* to NSF award "Recovery of ecosystem structure and function following exotic species eradication" (co-authored with PIs Orlando Sarnelle and Roland Knapp), 2002 (\$6000)

- Ecological Dissertations in the Aquatic Sciences participant (Eco-DAS VIII, formerly DIALOG) (2008)
- Michigan State University Distinguished Fellowship, 2000 and 2004

PEER-REVIEWED PUBLICATIONS *indicates undergraduate author

- **Kramer, A. M.**, C. S. Teitelbaum, A. Griffin, and J. M. Drake. 2019. Multi-scale model of regional population decline in little brown bats due to white-nose syndrome. *Ecology and Evolution*, *in press*.
- **Kramer, A.M.**, Berec, L. and J.M. Drake. 2018. Editorial: Allee effects in ecology and evolution. *Journal of Animal Ecology*, 87: 7-10. doi: 10.1111/1365-2656.12777
- Berec, L., **A.M. Kramer**, V. Bernhauerova, J.M. Drake. 2018. Density-dependent selection on mate-searching traits and evolution of mate-finding Allee effects. *Journal of Animal Ecology*, 87:24-35. doi: 10.1111/1365-2656.12662
 - *Featured as an In Focus article: A Kuparinen. 2018. The mechanistic basis of demographic Allee effects: the search for mates. Journal of Animal Ecology 87:4-6.*
- **Kramer, A.M.**, G. Annis, M.E. Wittmann, W.L. Chadderton, E.S. Rutherford, D.M. Lodge, L. Mason, D. Beletsky, C. Riseng, J.M. Drake. 2017. Suitability of Laurentian Great Lakes for invasive species based on global species distribution models and local habitat. *Ecosphere*, 8:e01883 doi: 10.1002/ecs2/1883
- Schatz, A.M.*, **A.M. Kramer**, J.M. Drake. 2017. Accuracy of climate-based forecasts of pathogen spread. *Royal Society: Open Science*, 4:60975. doi: 10.1098/rsos.160975
- Schmidt, J.P., A.W. Park, **A.M. Kramer**, B.A. Han, L.W. Alexander and J.M. Drake. 2017. Spatiotemporal fluctuations and triggers of Ebola virus spillover. *Emerging Infectious Diseases*, 23: 415-422. doi: 10.3201/eid2303.160101
- Wittman, M.E., G. Annis, **A.M. Kramer**, L. Mason, C. Riseng, E. Rutherford, W.L. Chadderton, D. Beletsky, J.M. Drake and D.M. Lodge. 2017. Refining species distribution model outputs using landscape-scale habitat data: Forecasting Grass Carp and Hydrilla establishment in the Great Lakes region. *Journal of Great Lakes Research*, 43:298-307. doi: 10.1016/j.jglr.2016.09.008
- **Kramer, A.M.**, J.E. Ward, F.C. Dobbs, M. Pierce, and J.M. Drake. 2016. The contribution of marine aggregate-associated bacteria to the accumulation of pathogenic bacteria in oysters: an agent-based model. *Ecology and Evolution*, 6: 7397-7408. doi:10.1002/ece3.2467
- **Kramer, A.M.**, J.T. Pulliam, L.W. Alexander, A.W. Park, P. Rohani and J.M. Drake. 2016. Spatial spread of the West Africa Ebola epidemic. *Royal Society: Open Science*, 3 160294. doi: 10.1098/rsos.160294
- Han, B.A., **A.M. Kramer**, and J.M. Drake. 2016. Global patterns of zoonotic disease in mammals. *Trends in Parasitology*. 32: 565-577. doi: 10.1016/j.pt.2016.04.007
 - *Cover and feature article, popular press including: BBC World Service, The Washington Post, Northeast Public Radio, El Pais, Tech Times, The Scientist.*
- Lodge, D.M., P.W. Simonin, S.W. Burgiel, R.P. Keller, J.M. Bossenbroek, C.L. Jerde, **A.M. Kramer**, et al. 2016. Invasion science to inform policy and management: risk analysis and bioeconomics of invasive species. *Annual Review of Environment and Resources*, 41:453-488. doi: 10.1146/annurev-environ-110615-085532. (*Lead section author*)
- Dallas, T., **A.M. Kramer**, M. Zokan, J.M. Drake. 2016. Ordination obscures the influence of

environment on plankton metacommunity structure. *Limnology and Oceanography Letters*, 1: 54-61. doi: 10.1002/lol2.10028

- Kaul, R.B., **A.M. Kramer**, F.C. Dobbs, J.M. Drake. 2016. Experimental demonstration of an Allee effect in microbial populations. *Biology Letters*. 12: 20160070. doi: 10.1098/rsbl.2016.0070
- Drury, K.L.S., J.D. Suter*, J.B. Rendall*, **A.M. Kramer** and J.M. Drake. 2015. Immigration can destabilize tri-trophic interactions: implications for conservation of top predators. *Theoretical Ecology*. 8:285-296. doi: 10.1007/s12080-014-0249-1
- Drake, J.M., R.B. Kaul, L. Alexander, S. O'Regan, **A.M. Kramer**, et al. 2015. Ebola cases and health system demand in Liberia. *PLOS Biology*, Jan 13: 10.1371/journal.pbio.1002056
- **Kramer, A.M.** and J.M. Drake. 2014. Time to competitive exclusion. *Ecosphere*, 5:52. <http://dx.doi.org/10.1890/ES14-00054.1>
- Lasley-Rasher, R.S., **A.M. Kramer**, V. Burdett-Coutts, J. Yen. 2014. Assessing the in situ fertilization status of two marine copepod species, *Temora longicornis* and *Eurytemora herdmani*; how common are unfertilized eggs in nature?. *PLoS ONE* 9(11):e112920. doi: 10.1371/journal.pone.0112920
- **Kramer, A.M.**, M.M. Lyons, F.C. Dobbs, J.M. Drake. 2013. Bacterial colonization and extinction on marine aggregates: stochastic model of species presence and abundance. *Ecology and Evolution*, 3: 4300-4309. doi: 10.1002/ece3.789
- Maher, S.P., **A.M. Kramer**, et al. 2012. Spread of white-nose syndrome on a network regulated by geography and climate. *Nature Communications* 3, 1306 doi:10.1038/ncomms2301
- Drake, J.M. and **A.M. Kramer**. 2012. Mechanistic analogy: how microcosms explain nature. *Theoretical Ecology* 5:433-444 doi: 10.1007/s12080-011-0134-0
- **Kramer, A. M.**, O. Sarnelle and J. Yen. 2011. The effect of mating behavior and temperature variation on the critical population density of a freshwater copepod. *Limnology and Oceanography* 56:707-715.
- Drake, J.M. and **A.M. Kramer**. 2011. Allee effects. *Nature Education Knowledge* 2(9):2.
- Yen, J., J. Sehn*, K. Catton, **A. M. Kramer** and O. Sarnelle. 2011. Pheromone trail following in three dimensions by the freshwater copepod *Hesperodiptomus shoshone*. *Journal of Plankton Research*. 33:907-916.
- Vercken, E., **A.M. Kramer**, P.C. Tobin, J.M. Drake. 2011. Critical patch size generated by Allee effect in gypsy moth, *Lymantria dispar* (L.). *Ecology Letters*. 14:179-186.
- **Kramer, A. M.** and J. M. Drake. 2010. Experimental demonstration of population extinction due to a predator-driven Allee effect. *Journal of Animal Ecology* 79: 633–639.
 - *Featured as an In Focus article with commentary: S.D. Gregory and F. Courchamp. 2010. Safety in numbers: extinction arising from predator-driven Allee effects. Journal of Animal Ecology* 79:511-514.
- Griffen, B., D. Spooner, **A. M. Kramer**, A. Santoro, A. Spivak, and N. Kelly. 2010. Moving species redundancy toward a more predictive framework. p. 30-46. In: P.F. Kemp [ed.], *Eco-DAS VIII Symposium Proceedings*. ASLO. doi:10.4319/ecodas.2010.978-0-9845591-1-4.30
- **Kramer, A. M.**, B. Dennis, A.M. Liebhold, and J. M. Drake. 2009. The evidence for Allee effects. *Population Ecology* 51: 341-354.
- **Kramer, A. M.**, O. Sarnelle and R. A. Knapp. 2008. Allee effect limits colonization success of

sexually reproducing zooplankton. *Ecology* 89: 2760–2769.

- **Kramer, A. M.** and O. Sarnelle. 2008. Limits to genetic bottlenecks and founder events imposed by the Allee effect. *Oecologia* 157:561-569.
- **Kramer, A. M.** and L. Francis. 2004. Predation resistance and nematocyst scaling for *Metridium senile* and *M. farcimen*. *Biological Bulletin* 207 (2): 130-140.

OTHER PUBLICATIONS

- Drake, J.M., L. Berec, and **A.M. Kramer**. 2019. Allee effects. In: Fath, B.D. (editor in chief) *Encyclopedia of Ecology*, 2nd edition, vol.3, pp.6–13. Oxford: Elsevier. doi: 10.1016/B978-0-12-409548-9.10587-1.

COURSES TAUGHT

- **Instructor**, BSC 2011 Biological Diversity, University of South Florida. Lecture. (Fall 2019, 250 students).
- **Instructor**, PCB 6456C Biometry, University of South Florida. Lecture and lab. (Spring 2019).
- **Instructor**, BSC 2011 Biological Diversity, University of South Florida. Lecture. (Fall 2018, 160 students).
- **Co-Instructor**, FANR 3200 Ecology of Natural Resources, University of Georgia. Lecture and field-based lab. (Spring 2017: 53 students).
- **Instructor**, ECOL 1000 Ecological Basis of Environmental Issues, University of Georgia (Fall 2016: 15 students).
- **Co-Instructor**, ECOL 4500 Evolutionary Ecology, University of Georgia (Spring 2015: 13 students).
- **Instructor**, BIOL 1101 Biology: the Human Experience, Gainesville State College, Gainesville, GA. (Summer 2009: 2 sections of lecture and laboratory, 20 students each).
- **Co-Instructor**, ECOL 4000/6000 Population and Community Ecology, University of Georgia (Fall 2008: 20 students).
- **Instructor**, ECOL 3500 Ecology, University of Georgia (Summer 2008: 28 students).

MENTORING

Graduate students at the University of South Florida

- Travis Flock, Masters in Integrative Biology: Spring 2018 – current. A Synthesis of Trait-Mediated Interactions and Indirect Effects within Predator-Prey Dynamics.
- Fargam Neinavaie, PhD in Integrative Biology: Spring 2018 – current. Predator-prey dynamics of cancer and immune system.

Undergraduate research at the University of South Florida

- Alexander Mercier: Fall 2018 – current. Mathematical models in disease ecology
- Jessica Garby: Fall 2018 – current. Population dynamics of freshwater zooplankton.

Advisor for NSF Research Experience for Undergraduates students

- Summer 2016: Yaw Kumi-Ansu

- Project: Investigating accuracy of climate vs. yearly weather for predicting the spread of white-nose syndrome in the United States
- Summer 2015: Annakate Schatz
 - Project: Model accuracy in forecasting pathogen spread using climatic data
- Summer 2002: Blair Wilson
 - Project: Detecting mating pheromones in *Hesperodiaptomus shoshone*

Mentor for undergraduate research:

- Spring 2014: Navdeep Singh: Predicting spatial spread of non-stationary wildlife disease
- Summer 2013 – Summer 2014: Deeran Patel: Predicting spatial spread of non-stationary disease using species distribution models
- Spring 2010-Spring 2012: Tierney O’Sullivan and Theresa Stratmann, experimental and theoretical research on *Daphnia* population dynamics.

Advisor for undergraduates assisting with my Ph.D. research and the High Sierra Experimental Lakes Project

- Summer 2004: Chris Brownfield
- Summer 2003: Greg Goldsmith, Dispersal of limnetic zooplankton via streams in Humphreys Basin, Sierra Nevada

PRESENTATIONS AND WORKSHOPS

Invited:

- University of South Florida, Environment and Water Resources Engineering Seminar Series. April 12, 2019. Title: Estimating environmental and biotic niches of aquatic organisms.
- Washington State University, School of the Environment, March 2017. Title: Forecasting invasion and explaining extinction in aquatic systems.
- Auburn University, Department of Biological Sciences, March 2017. Title: Forecasting ecological change: invasive species and emerging diseases.
- University of South Florida, Department of Integrative Biology, January 2017. Title: Forecasting ecological change: invasive species and emerging diseases.
- Summer Academy, Exploring Environmental Science: Hands on program on aquatic ecology for 11-14 year old students. State Botanical Garden of Georgia June 6, 2016.
- Organizer, Oral Session for the 100th meeting of the Ecological Society of America in Baltimore, MD. Allee effects: theory and applications. Co-organized with Ludek Berec and John Drake.
- Cary Institute of Ecosystem Studies, Millbrook, New York. November 2014. Title: Can we forecast invasive species distributions?
- Leibniz Institute for Freshwater Ecology and Inland Fisheries (IGB), Berlin, Germany. April 2014. Title: Finding mates, surviving predators and staying competitive: zooplankton in microcosm and whole-lake experiments
- Kennesaw State University, Ecology and Evolution seminar series, September 2013. Title: Finding mates, surviving predators and staying competitive: zooplankton in microcosm and whole-lake experiments

- Leadership without Limits! Presentation on species interactions and species conservation in aquatic systems. Program is for high school students that are children of migrant farm workers, will be developing community projects on water issues. June 2013.
- Computational Ecology and Epidemiology Study Group, University of Georgia, tutorial on using R to produce high quality figures and graphics. February 2012
- Mammoth Lakes Academy (high school), research and career seminar, August 2011
- University of South Carolina, Biological Sciences seminar, March 2011. Title: Finding mates and surviving predators: Allee effects in small populations
- Ohio State University, School of Environment and Natural Resources, February 2011. Title: Finding mates and surviving predators: Allee effects in small populations
- Oceans and Human Health, Gordon Research Seminar, June 2010. Title: Islands of aquatic pathogens: modeling pathogen species accumulation on marine aggregates
- Eco-DAS symposium, University of Hawaii-Manoa, October 2008. Title: Are Allee effects important to community resiliency and species recovery?
- Auburn University, Fisheries and Allied Aquaculture seminar, September 2008. Title: Dynamics of low density populations: Allee effects and recovery from local extinction
- Michigan State University, Fisheries and Wildlife Graduate Student Organization seminar April 2006

Contributed: (presenting author, * indicates undergraduate author)

- **A.M. Kramer** and J.M. Drake. Visualization for communication throughout data-intensive research projects. Ecological Society of America, Aug 2018, New Orleans.
- **A.M. Kramer**, C. Teitelbaum, A. Griffin and J.M. Drake. Linking within- and between-cave scales to understand population dynamics of bats infected by white-nose syndrome. (poster). Ecological Society of America, Aug 2017, Portland.
- J.M. Drake, J.P. Schmidt, A.W. Park, A.M. Kramer, B. Han and L. Alexander. Early warning systems for spillover of zoonotic pathogens. Ecological Society of America, Aug 2017, Portland.
- J.M. Drake, J.P. Schmidt, A.W. Park, A.M. Kramer, B. Han and L. Alexander. Dynamic risk mapping of zoonotic spillover. Epidemics, Dec 2017, Sitges, Spain.
- **A.M. Kramer**, M.E. Wittman, G. Annis, L. Mason, C. Riseng, E. Rutherford, W.L. Chadderton, D. Beletsky, J.M. Drake and D.M. Lodge. Predicting habitat suitability for invasive species in the Great Lakes: Combining species distribution models and high resolution aquatic variables. (poster). Ecological Society of America, Aug 2015, Baltimore.
- Drake, J.M., A.M. Kramer, L. Alexander, J.T. Pulliam, & A.W. Park. Spatial spread of the West Africa Ebola epidemic at two scales. Society for Mathematical Biology Annual Meeting, July 2, 2015. (Invited presentation).
- Maher, S.P., A.M. Kramer, J.T. Pulliam, K.E. Langwig, A.M. Kilpatrick, W.F. Frick and J.M. Drake. Visiting an old friend: using recent data to revise expectations of white-nose syndrome spread. American Society of Mammologists, June 2015, Jacksonville.
- **Kramer, A.M.**, D. Patel*, J.M. Drake. Predicting future spread during an outbreak using species distribution models. Ecological Society of America, Aug 2014, Sacramento.
- Kaul, R.B., A.M. Kramer, F.C. Dobbs, J.M. Drake. Allee effects: scaling down to the microbial level. Ecological Society of America, Aug 2014, Sacramento.

- **Kramer, A.M.**, G. Annis, M. E. Wittmann, W. L. Chadderton, E. Rutherford, L. Mason, J. M. Drake. Predicting potential distribution of invasive species using range bagging: golden mussel and killer shrimp in the Great Lakes. Joint Aquatic Sciences Meeting, May 2014, Portland, OR.
- **Kramer, A.M.**, F. Dobbs, M. Maille Lyons, J.M. Drake. Tiny islands: Colonization and extinction of microbial species on marine aggregates. Ecological Society of America, Aug. 2013, Minneapolis.
- **Kramer, A.M.**, J. E. Ward, M. Pierce, F. Dobbs, J.M. Drake. Understanding the contribution of marine aggregate-associated bacteria to pathogen load in oysters using an agent-based model. Association for the Sciences of Limnology and Oceanography, Feb. 2013, New Orleans.
- **Kramer, A.M.**, J. E. Ward, M. Pierce, F. Dobbs, J.M. Drake. The contribution of marine aggregate-associated bacteria to pathogen load in oysters: an agent-based model. NSF Ecology and Evolution of Infectious Disease PI meeting, 2013, Athens GA (poster)
- **Kramer, A.M.**, J.T. Pulliam, S.P. Maher, and J.M. Drake. Simplifying networks: spread of White-nose syndrome in North America. Ecological Society of America 2012, Portland, OR.
- Maher, S.P., A.M. Kramer, et al. Non-diffusive spread of White-nose Syndrome regulated by spatial heterogeneity and climate. American Society of Mammologists June 2012, Reno, NV.
- Kaul, R.B., A.M. Kramer, F.C. Dobbs, J.M. Drake. Allee effects in experimental microbial systems. American Society for Microbiology 2012, San Francisco, CA. (poster).
- **Kramer, A.M.** and J.M. Drake. Population variance and extinction of two competitors consuming a common resource. Ecological Society of America 2011, Austin TX.
- Theresa Stratmann*, Tierney O'Sullivan*, Amara Channell*, Andrew Kramer, Marcus Zokan, Andrea Silletti and John Drake. Two paths to extinction: effect of deteriorating environments on extinction time and distribution. Ecological Society of America 2011, Austin TX. (poster)
- **Kramer, A.M.** and J.M. Drake. Mechanistic model of bacterial persistence on marine aggregates. NSF Ecology and Evolution of Infectious Disease PI meeting, 2011, Madison WI (poster)
- **Kramer, A.M.**, E. Vercken, P. Tobin, J.M. Drake. Allee effects induce critical area for establishment in gypsy moth invasion. Ecological Society of America 2010, Pittsburgh, PA.
- M. Maille Lyons and A. M. Kramer. Microscopic islands: Modeling the theory of island biogeography for aquatic pathogens colonizing marine aggregates. NSF Ecology and Evolution of Infectious Disease PI meeting, 2010, Atlantic City NJ (poster)
- **Kramer, A.M.** and J.M. Drake. Allee effect due to predator functional response: effects on population growth rate and extinction in an experimental zooplankton system. Ecological Society of America 2008, Milwaukee, WI. (poster)
- **Kramer, A.M.** and O. Sarnelle. The Allee effect limits the loss of genetic variability during population bottlenecks. Ecological Society of America 2007, San Jose, CA.
- **Kramer, A.M.** and O. Sarnelle. Allee effect on population growth rate in sexually reproducing zooplankton. American Society of Limnology and Oceanography 2007 Aquatic Sciences meeting, Santa Fe, NM
- **Kramer, A.M.**, Sarnelle, O, and Knapp, R.A. Allee effect limits re-establishment of an alpine copepod: multi-lake stocking experiment. American Society of Limnology and Oceanography 2005 Summer meeting, Santiago de Compostela, Spain

Workshops:

- Great Lakes Mississippi Rivers Interbasin Study – Brandon Road: expert elicitation on effect of management scenarios on invasive scud – *Apocorophium lacustre*. (Invited expert). December 2015.
- Marine Biosecurity Workshop: Research frontiers from integrative marine biosecurity analyses. Environment Institute, University of Adelaide, Australia. (Invited presenter).
- NIMBioS Investigative Workshop: Individual-based Ecology of Microbes. National Institute for Mathematical and Biological Synthesis, University of Tennessee, June 2011. (Presenter).

PROFESSIONAL SERVICE

- **Subject Matter Editor:** Ecosphere. (September 2016-present).
- **Journal special issues:** Journal of Animal Ecology, Editing a Special Feature on Allee effects, 2017
- **Journal reviews:**
 - General Ecology: Ecology (5), Ecology Letters (4), Oikos (6), Proceedings of the Royal Society B (3), American Naturalist, Ecological Applications (2), Evolution, Journal of Animal Ecology (5), Limnology and Oceanography, Nature Communications (3), Biology Letters, Ecosphere (2), Oecologia, Ecology and Evolution, Journal of Applied Ecology
 - Theory/Modeling: Methods in Ecology and Evolution, Bulletin of Mathematical Biology, Ecological Modelling,
 - Specialty journals: PLoS ONE (5), Scientific Reports, Genetics (2), Conservation Biology, Biological Invasions, Diversity and Distributions, Ecography (2), Behavioral Ecology, Ecological Entomology, Behaviour, Behavioral Ecology and Sociobiology, Restoration Ecology, Population Ecology (5), Environments, Systems and Decisions, American Midland Naturalist, Transactions American Fisheries Society, Journal of Mammology, Freshwater Science, Journal of Great Lakes Research (2), Hydrobiologia.
- **Proposal reviews:** NSF Population and Community Ecology Panel (2), NSF Biological Oceanography (2), NSF Geography and Spatial Science (1), Oregon Sea Grant.
- **Contributing expert:** Great Lakes and Mississippi River Interbasin Study – Brandon Road: expert elicitation on effect of management scenarios on invasive scud – *Apocorophium lacustre*. December 2015.
- **Curriculum reviews:** SEPUP/Science Education for Public Understanding Program, Lawrence Hall of Science, UC Berkeley
- **Presentation judge,** Odum School of Ecology Graduate Student Symposium, 2010, 2011, 2013-2017. Georgia Science and Engineering Fair: 2015, 2016.
- **Professional Societies:** Ecological Society of America (since 2003), American Society of Limnology and Oceanography (since 2003)