**Kevin Gross**

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## Education

| | | |
|---|---|---|
| Ph.D. | 2003 | Zoology and Statistics. University of Wisconsin-Madison, Madison, WI.<br>Advisors: Prof. Anthony R. Ives and Prof. Erik V. Nordheim<br>Research area: Statistical ecology and structured population dynamics. |
| M.S. | 2000 | Statistics. University of Wisconsin-Madison, Madison, WI. |
| B.S. | 1996 | Biology. Duke University, Durham, NC. |

## Positions Held

*Professor (with tenure).* North Carolina State University, Department of Statistics, Raleigh NC. 2015 – present. Core faculty member of Biomathematics Graduate Program. *Associate Professor* 2009 – 2015. *Assistant Professor* 2003 – 2009.

NCSU Associate faculty appointments:
Department of Applied Ecology 2015 – present
Department of Biology 2004 – 2015

*Visiting scholar.* University of Washington, Department of Biology. 2016 – 2019 (portions).

*Visiting fellow.* Institute of Advanced Study in Toulouse. 2024.

## Publications

Annotation indicating individuals working under my mentorship:
§: post-doc
†: graduate student
‡: undergraduate student

Refereed journal articles:

69. Gross, K., and C.T. Bergstrom. 2024. Rationalizing risk aversion in science: Why incentives to work hard clash with incentives to take risks. *PLoS Biology* 22(8):e3002750. https://doi.org/10.1371/journal.pbio.3002750

68. Cho, C., Z. Brown, K. Gross, and D. Tregeagle. 2024. Developing practical measures of the price of pesticide resistance: A flexible computational framework with global sensitivity analysis. *Journal of the Agricultural and Applied Economics Association*, 1–16. https://doi.org/10.1002/jaa2.107

67. Maurer, A.S., K. Gross., and S.P. Stapleton. 2022. Beached *Sargassum* alters sand thermal environments: Implications for incubating sea turtle eggs. *Journal of Experimental Marine Biology and Ecology*, 546: 151650.

66. Gross, K. and C.T. Bergstrom. 2021. Why ex post peer review encourages high-risk research while ex ante review discourages it. *Proceedings of the National Academy of Sciences*, 118(51):e2111615118. DOI 10.1073/pnas.2111615118.

65. Gross, K. and A.M. de Roos. 2021. Resonance in physiologically structured population models. *Bulletin of Mathematical Biology* 83:86. 10.1007/s11538-021-00915-2

64. †Hall, T.E., †A.S. Freedman, A.M. de Roos, P.J. Edmunds, R.C. Carpenter, and K. Gross. 2021. Stony coral populations are more sensitive to changes in vital rates in disturbed environments. *Ecological Applications* 31(2):e02234. 10.1002/eap.2234

63. Courtney, T.A., Barnes, B.B., and 10 others. 2020. Disturbances drive changes in coral community assemblages and coral calcification capacity. *Ecosphere* 11(4):e03066. 10.1002/ecs2.3006.

62. Grantham, N.S., Y. Guan, B.J. Reich, E.T. Borer, and K. Gross. 2020. MIMIX: A Bayesian mixed-effects model for microbiome data from designed experiments. *Journal of the American Statistical Association* (Applications & Case Studies). 115: 599 – 609.

61. Gross, K., and C.T. Bergstrom. 2019. Contest models highlight inherent inefficiencies of scientific funding competitions. *PLoS Biology* 17(1):e3000065. 10.1371/journal.pbio.3000065.

60. Rana, S.K., K. Gross, and T.D. Price. 2019. Drivers of elevational richness peaks, evaluated for trees in the east Himalaya. *Ecology* 100(1): e02548. 10.1002/ecy.2548.

59. §Stone, C., and K. Gross. 2018. Evolution of host preference in anthropophilic mosquitoes. *Malaria Journal* 17:257. 10.1186/s12936-018-2407-1.

58. Guest, J.R., P.J. Edmunds, and 16 others. 2018. A framework for identifying and characterising coral-reef "oases" against a backdrop of degradation. *Journal of Applied Ecology* 55: 2865 – 2875. 10.1111/1365-2664.13179.

57. Nissen, S.B., T. Magidson, K. Gross*, and C.T. Bergstrom*. 2016. Publication bias and the canonization of false facts. *eLife*, 5: e21451. *co-senior authors.

56. †Backus, G.A., and K. Gross. 2016. Genetic engineering to eradicate invasive mice on islands: Modeling the efficiency and ecological impacts. *Ecosphere*, 7: e01589.

55. Gross, K. and A. Snyder-Beattie†. 2016. A general, synthetic model for predicting biodiversity gradients from environmental geometry. *American Naturalist*, 188: E85–E97.

54. Mehra, L.K., C. Cowger, K. Gross, and P.S. Ojiambo. 2016. Predicting pre-planting risk of *Stagnospora nodorum* blotch of winter wheat using machine learning models. *Frontiers in Plant Science*, 7: 390.

53. Edmunds, P.J., S. Comeau, and 14 others. 2016. Integrating the effects of ocean acidification across functional scales on tropical coral reefs. *BioScience* 66: 350–362.

52. §Stone, C., N. Chitnis, and K. Gross. 2016. Environmental influences on mosquito foraging and integrated vector management can delay the evolution of behavioral resistance. *Evolutionary Applications* 9: 502–517. 10.1111/eva12354.

51. §Mordecai, E.A., K. Gross, and C.E. Mitchell. 2016. Within-host niche differences and fitness tradeoffs promote coexistence of plant viruses. *American Naturalist* 187: E13 – E26.

50. §Mordecai, E.A., N.A. Molinari, K.A. Stahlheber, K. Gross, and C. D'Antonio. 2015. Controls over native perennial grass exclusion and persistence in California grasslands invaded by annuals. *Ecology* 96: 2643–2652.

49. Fabina, N.S., M.L. Baskett, and K. Gross. 2015. The differential effects of increasing frequency and magnitude of extreme events on coral populations. *Ecological Applications* 25: 1534–1545.

48. Gross, K., and P.J. Edmunds. 2015. Stability of Caribbean coral communities quantified by long-term monitoring and autoregression models. *Ecology* 96: 1812–1822.

47. Cayton, H., N. Haddad, K. Gross, S.E. Diamond, and L. Ries. 2015. Do growing degree days predict phenology across butterfly species? *Ecology* 96: 1473–1479.

46. Venail, P., K. Gross, T.H. Oakley, A. Narwani, E. Allan, P. Flombaum, F. Isbell, J. Joshi, P.B. Reich, D. Tilman, J. van Ruijven, and B.J. Cardinale. 2015. Species richness, but not phylogenetic diversity, influences community biomass production and temporal stability in a re-examination of 16 grassland biodiversity studies. *Functional Ecology* 29: 615–626.

45. Seabloom, E., E. Borer, K. Gross, A. Kendig, C. Lacroix, C. Mitchell, §E. Mordecai, and A. Power. 2015. The community ecology of pathogens: coinfection, coexistence, and community composition. *Ecology Letters* 18: 401–415.

44. Cook, M.A., M.N. Peterson, M.C. Chitwood, D. Palmer, C.S. Deperno, and K. Gross. 2015. Evaluating deer hunters' support for hunting deer with dogs. *Human Dimensions of Wildlife*, 20: 174–181.

43. Edmunds, P.J., M. Adjeroud, and 21 others. 2014. Persistence and change in community composition of reef corals through present, past and future climates. *PLoS ONE* 9(10): e107525. 10.1371/journal.pone.0107525.

42. Baskett, M.L, N.S. Fabina, and K. Gross. 2014. Response diversity can increase ecological resilience to disturbance in coral reefs. *American Naturalist* 184(2): E16 – E31.

41. Williams, V.N., B.J. Reading, H. Amano, N. Hiramatsu, J. Schilling, S.A. Salger, T.I. Williams, K. Gross, and C.V. Sullivan. 2014. Proportional accumulation of yolk proteins derived from multiple vitellogenins is precisely regulated during vitellogenesis in striped bass (*Morone saxatilis*). *Journal of Experimental Zoology Part A: Ecological Genetics and Physiology*, 321A: 301–315. 10.1002/jez.1859.

40. Picha, M.E., P.R. Biga, N. Galt, A. S. McGinty, K. Gross, V.S. Hedgpeth, T.D. Siopes, and R.J. Borski. 2014. Overcompensation of circulating and local insulin-like growth factor-I during catch-up growth in hybrid striped bass (Morone chrysops X Morone saxatilis) following temperature and feeding manipulations. *Aquaculture* 428-429: 174-183. 10.1016/j.aquaculture.2014.02.028

39. Gross, K., B. J . Cardinale, J. W. Fox, A. Gonzalez, M. Loreau, H. W. Polley, P. B. Reich and J. van Ruijven. 2014. Species richness and the temporal stability of biomass production: A new analysis of recent biodiversity experiments. *American Naturalist* 183: 1-12. doi 10.1086/673915

38. †Fiske, I.J. , J.A. Royle and K. Gross. 2014. Inference for finite-sample trajectories in dynamic multi-state site-occupancy models using hidden Markov model smoothing. *Environmental and Ecological Statistics* 21: 313–328. 10.1007/s10651-013-0256-1.

37. Cardinale, B.J., K. Gross, K. Fritschie, P. Flombaum, J. Fox, C. Rixen, J. van Ruijven, P. Reich, M. Scherer-Lorenzen, and B.J. Wilsey. 2013. Biodiversity simultaneously enhances the production and stability of community biomass in experimental systems of primary producers, but the effects are independent. *Ecology* 94: 1697-1707.

36. Raybuck, A.L., C. E. Moorman, C.H. Greenberg, C.S. DePerno, K. Gross, D. M. Simon and G. S. Warburton. 2012. Short-term response of small mammals following oak regeneration silviculture treatments. *Forest Ecology & Management* 274: 10-16.

35. †Canner, J.E., R.R. Dunn, I. Giladi, and K. Gross. 2012. Redispersal of seeds by a keystone ant augments the spread of common wildflowers. *Acta Oecologica* 40:31-39.

34. Rosenheim, J.A., S. Parsa, A. A. Forbes, W. A. Krimmel, Y. H. Law, M. Segoli, M. Segoli, F. J. Sivakoff, T. Zaviezo, and K. Gross. 2011. Ecoinformatics for integrated pest management: expanding the applied insect ecologist's tool-kit. *Journal of Economic Entomology* 104: 331-342. 10.1603/EC10380.

33. Gross, K. and J. A. Rosenheim. 2011. Quantifying secondary pest outbreaks in cotton and their monetary cost with causal inference statistics. *Ecological Applications* 21: 2770-2780.

32. Haddad, N.M., G.M. Crutsinger, K. Gross, J. Haarstad, and D. Tilman. 2011. Plant diversity and the stability of foodwebs. *Ecology Letters* 14:42-46.

31. †Allen, S.D., Y. Fathi, K. Gross, and M. Mace. 2010. An optimal and near-optimal strategy to selecting individuals for transfer in captive breeding programs. *Biological Conservation* 143: 2858-2863.

30. Weiser, M.D., N. J. Sanders, and 23 others. 2010. Canopy and litter and assemblages share similar climate-species density relationships. *Biology Letters* 6: 769-772. 10.1098/rsbl.2010.0151.

29. Midway, S., D.D. Aday, T.J. Kwak, and K. Gross. 2010. Cover preference of the Carolina madtom (Notorus furiosus), an imperiled, endemic southeastern stream fish. *Journal of Freshwater Ecology* 25: 151-154.

28. Haddad, N.M., G.M. Crutsinger, K. Gross, J. Haarstad, J. M.H. Knops, and D. Tilman. 2009. Plant species loss decreases arthropod diversity and shifts trophic structure. *Ecology Letters* 12: 1029-1039.

27. Cardinale, B.J., H. Hillebrand, W. S. Harpole, K. Gross, and R. Ptacnik. 2009. Separating the influence of resource 'availability' from resource 'imbalance' on productivity-diversity relationships. *Ecology Letters* 12: 475-487.

26. Cardinale, B. J., D. Bennett, C. Nelson, and K. Gross. 2009. Does diversity drive productivity or vice versa? A test of the multivariate productivity-diversity hypothesis in streams. *Ecology* 90:1227-1241.

25. Gross, K. 2008. Positive interactions among competitors can produce species-rich communities. *Ecology Letters* 11: 929-936.

24. Harvey, C. J., K. Gross, V. H. Simon, and J. Hastie. 2008. How trophic and fishery interactions with Pacific hake might affect the rebuilding times of overfished rockfish. *Marine Ecology Progress Series* 365: 165-176.

23. Haddad, N. M., B. R. Hudgens, C. D. Damiani, K. Gross, and D. Kuefler. 2008. Optimal monitoring for rare butterfly populations. *Conservation Biology* 22: 929-940.

22. Gross, K. 2008. Fusing spatial resource heterogeneity with a competition-colonization trade-off in model communities. *Theoretical Ecology* 1: 65-75.

21. Abbott, K.C., W. F. Morris, and K. Gross. 2008. Simultaneous effects of food limitation and inducible resistance on herbivore population dynamics. *Theoretical Population Biology* 73:63-78.

20. Gross, K., and B. J. Cardinale. 2007. Does species richness drive community productivity or vice versa? Reconciling historical and contemporary paradigms in competitive communities. *American Naturalist* 170: 207-220.

19. Gross, K., ‡E. J. Kalendra, B. R. Hudgens, and N. M. Haddad. 2007. Robustness and uncertainty in estimates of butterfly abundance from transect counts. *Population Ecology* 49: 191-200.

18. Gross, K., W .F. Morris, M. S. Wolosin, and D. F. Doak. 2006. Modeling vital rates improves estimation of population projection matrices. *Population Ecology* 48: 79-89.

17. Kilpatrick, A.M., D. LaPointe, C.T. Atkinson, B.L. Woodworth, J.K. Lease, M.E. Reiter, and K. Gross. 2006. Effects of chronic avian malaria (*Plasmodium relictum*) infection on the reproductive success of Hawaii Amakihi (*Hemignathus virens*). *Auk* 123: 764-774.

16. Gross, K., and B. J. Cardinale. 2005. The functional consequences of random versus ordered species extinctions. *Ecology Letters* 8: 409-418.

15. Doak, D.F., K. Gross, and W.F. Morris. 2005. Understanding and predicting the effects of sparse data on demographic analyses. *Ecology* 86: 1154-1163.

14. Gross, K., A. R. Ives, and E. V. Nordheim. 2005. Estimating fluctuating vital rates from time-series data: a case study of aphid biocontrol. *Ecology* 86:740-752.

13. Nol, P., T. E. Rocke, K. Gross, and T. M. Yuill. 2004. Prevalence of active Clostridium botulinum type C in the gastrointestinal tracts of tilapia (*Oreochromis mossambicus*) in the Salton Sea. *Journal of Wildlife Diseases* 40:414-419.

12. Cardinale, B. J., A. R. Ives, C. T. Harvey, and K. Gross. 2003. Biodiversity and biocontrol: emergent impacts of a multi-enemy assemblage on pest suppression and crop yield in an agroecosystem. *Ecology Letters* 6: 857-865.

11. Dodson, S. I., A. Z. Grishanin, K. Gross, and G. A. Wyngaard. 2003. Morphological analysis of cryptic species in the Acanthocyclop syemalis species complex. *Hydrobiologia* 500:131-143.

10. Rooney, T. P., and K. Gross. 2003. A demographic study of deer browsing impacts on Trillium grandiflorum. *Plant Ecology* 168: 267-277.

9. Gross, K., B. A. Craig, and W. D. Hutchison. 2002. Bayesian estimation of a demographic matrix model from stage-frequency data. *Ecology* 83: 3285-3298.

8. Gross, K. 2002. Efficient data collection for estimating growth rates of structured populations. *Ecology* 83:1762-1767.

7. Ives, A. R., K. Gross, and V. A. A. Jansen. 2000. Periodic mortality events in predator-prey systems. *Ecology* 81: 3330-3340.

6. Ives, A. R., J. L. Klug, and K. Gross. 2000. Stability and species richness in complex communities. *Ecology Letters* 3:399-411.

5. Olson, A., A. R. Ives, and K. Gross. 2000. Spatially aggregated parasitism on pea aphids, Acyrthosiphon pisum, caused by random foraging behavior of the parasitoid *Aphidius ervi*. *Oikos* 91:66-76.

4. Underwood, N., W. Morris, K. Gross, and J. R. Lockwood III. 2000. Induced resistance to Mexican bean beetles in soybean: variation among genotypes and lack of correlation with constitutive resistance. *Oecologia* 122:83-89.

3. Gross, K. and A. R. Ives. 1999. Inferring host-parasitoid stability from patterns of parasitism among patches. *American Naturalist* 154:489-496.

2. Ives, A. R., K. Gross, and J. L. Klug. 1999. Stability and variability in competitive communities. *Science* 286:542-544.

1. Gross, K., J.R. Lockwood III, C.C. Frost, and W.F. Morris. 1998. Modeling controlled burning and trampling reduction for conservation of *Hudsonia montana*. *Conservation Biology* 12:1291-1301.

Non-refereed publications:

2. Gross, K. 2016. Biodiversity and productivity entwined. News & Views, *Nature*. 529: 293–294. 10.1038/nature16867.

1. Gross, K. 2012. Statistics in ecology. pp. 691–698 in *Encyclopedia of Theoretical Ecology*. A. Hastings and L. J. Gross, eds. University of California Press, Berkeley, CA.

Working paper:

1. Bak-Coleman, J., R. P. Mann, C. T. Bergstrom, K. Gross, and J. West. 2024+. Revisiting the replication crisis without false positives. `https://osf.io/preprints/socarxiv/rkyf7`

## Grants awarded

9. Collaborative Research: Understanding and overcoming the impediments to high-risk, high-return science. NSF award SES-2346644. Collaboration with C.T. Bergstrom. Funded 4/15/24 – 3/31/27. $200,282 (KG portion).

8. Collaborative Research: How do publication and funding filters shape the science that we do, and how we learn from it? NSF award SMA-1952343. Collaboration with C.T. Bergstrom. Funded 9/1/20 – 8/31/23. $74,977 (KG portion).

7. Collaborative research: Ocean acidification and coral reefs: Scale dependence and adaptive capacity. NSF award OCE-1415300. Collaboration with R.C. Carpenter and P.J. Edmunds. Funded 1/1/15 – 12/31/19. $99,909 (KG portion).

6. RTG: Parameter estimation methodologies for mechanistic biological models. NSF award DMS-1246991. Co-PI with A. Lloyd (lead) and 3 others. Funded 8/1/13 – 7/31/19. $2,500,000 (total).

5. Collaborative research: Within-host microbial communities: experimentally scaling interaction dynamics across sites, regions, and continents. NSF Macrosystems award EF-1241794. Collaboration with E. Borer and 3 others. Funded 3/1/13 – 2/28/19. $49,960 (KG portion).

4. Collaborative research: The community ecology of viral pathogens - Causes and consequences of coinfection in hosts and vectors. NSF EEID award DEB-1015825. Collaboration with C.E. Mitchell and 4 others. Funded 7/1/10 – 6/30/15. $358,631 (KG portion).

3. Collaborative research: Does productivity drive diversity or vice versa? Empirical and theoretical investigations of the multivariate productivity-diversity hypothesis in streams. NSF award DEB-0842101. Collaboration with B. Cardinale. Funded 3/15/09 – 3/14/13. $165,927 (KG portion).

2. Bioinformatics for IPM: Using Consultant-Generated Data to Solve Difficult Problems in Applied Insect Ecology. Subcontract on USDA-NRICGP grant 2006-01761 led by J. Rosenheim. Funded 2/15/07 – 2/14/11. $48,081 (KG portion).

1. Collaborative: MSPA-CSE: Analysis and detection of transient dynamics in ecological systems. NSF award EF-0434298. Collaboration with A. Hastings and T. Ives. Funded 10/1/04 – 9/31/08. $132,267 (KG portion).

## Presentations

Departmental seminars and colloquia:

26. NCSU Dept. of Entomology and Plant Pathology, 2024
25. Institute for Advanced Study in Toulouse, Toulouse, France, 2024
24. NCSU Genetic Engineering & Society center, 2020
23. Duke University Dept. of Biology, Durham, NC, 2019
22. NOAA NMFS Northwest Fisheries Science Center, Seattle, WA, 2017
21. Washington State University Dept. of Entomology, Pullman, WA, 2016
20. Cal State University – Northridge Dept. of Biology, Northridge, CA, 2016
19. University of Washington School of Fisheries and Aquatic Sciences, Seattle, WA, 2016
18. NCSU Dept. of Entomology, 2015
17. NCSU Ecology and Evolutionary Biology seminar, 2013
16. University of North Carolina – Chapel Hill Curriculum in Ecology, Chapel Hill, NC, 2013
15. University of North Carolina – Wilmington Dept. of Biology, Wilmington, NC, 2009
14. NOAA NMFS Northwest Fisheries Science Center, Seattle, WA, 2009
13. Appalachian State University Dept. of Mathematics, Boone, NC, 2008
12. NCSU Dept. of Statistics, 2008
11. University of North Carolina – Chapel Hill Curriculum in Ecology, Chapel Hill, NC, 2007

10. NCSU Dept. of Plant Biology, 2007
9. East Carolina University Ecology seminar, Greenville, NC, 2007
8. NCSU Biomathematics seminar, 2007
7. Virginia Tech Ecology and Evolutionary Biology seminar, Blacksburg, VA, 2006
6. University of Chicago Center for Integrating Statistical and Environmental Science, Chicago, IL, 2005
5. NCSU Dept. of Statistics, 2005
4. Duke University Program in Ecology, Durham NC, 2005
3. NCSU Biomathematics seminar, 2005
2. NCSU Dept. of Statistics, 2004
1. NCSU Dept. of Zoology, 2004

Conference and workshop presentations:

29. Santa Fe Institute, Santa Fe, NM, 2023 (invited)
28. Joint Statistical Meetings (online meeting), 2020 (invited)
27. American Society of Naturalists stand-alone meeting, Asilomar CA, 2018
26. Macrosystems Biology PI meeting, Arlington VA, 2016 (poster)
25. American Society of Naturalists stand-alone meeting, Asilomar CA, 2016
24. Entomological Society of America annual meeting, Portland OR, 2014 (invited)
23. University of Oregon META Center Symposium, Eugene, OR, 2014 (poster)
22. Ecological Society of America annual meeting, Minneapolis, MN, 2013
21. Ecology of Emerging Infectious Diseases PI meeting, Athens, GA, 2013 (poster)
20. Ecology of Emerging Infectious Diseases PI meeting, Berkeley, CA, 2013 (poster)
19. Ecological Society of America annual meeting, Austin, TX, 2011
18. Ecological Society of America annual meeting, San Jose, CA 2007
17. ENAR / IBS, Atlanta, GA 2007 (invited)
16. Ecological Society of America annual meeting, Memphis, TN 2006
15. Statistics, Combinatorics, Mathematics and Applications meeting, Auburn, AL, 2005 (invited)
14. Ecological Society of America annual meeting, Montreal, QC, 2005
13. JSM New Researcher's Conference, Minneapolis, MN, 2005
12. WNAR / IBS, Fairbanks, AK, 2005
11. Fifth Winemiller Symposium, Columbia, MO, 2004 (poster)
10. Joint Statistical Meetings, Toronto, ON, 2004
9. Ecological Society of America annual meeting, Portland, OR, 2004
8. Entomological Society of America, annual meeting, Fort Lauderdale, FL, 2002
7. Ecological Society of America annual meeting, Tucson, AZ, 2002 (invited)
6. ENAR / IBS, Charlotte, NC 2001
5. Ecological Society of America annual meeting, Snowbird, UT, 2000 (poster)
4. LTER All-Scientists Meeting, Snowbird, UT, 2000 (invited)
3. ENAR / IBS, Chicago, IL, 2000 (invited poster)
2. Ecological Society of America annual meeting, Spokane, WA, 1999
1. Ninth Lukacs Symposium, Bowling Green, OH, 1999.

## Classroom teaching

Courses taught:

| year | BIO/BMA 560 | BMA567 | BMA/ST 590 | BMA772 | BMA 801 | BMA 815 | ST 380 | ST 512 | ST 524 |
|---|---|---|---|---|---|---|---|---|---|
| 2003–04 | | | | x | | | x | | |
| 2004–05 | | | | x | | | x | | |
| 2005–06 | | | | x | | | x | | |
| 2006–07 | | | | x | | | x | x | |
| 2007–08 | | | | x | | | x | x | |
| 2008–09 | | | | x | x | | x | x | |
| 2009–10 | | x | | x | x | | | x | |
| 2010–11 | | | | x | | | | xx | |
| 2011–12 | | | | x | | | | xx | |
| 2012–13 | x | x | | | | | | x | |
| 2013–14 | | | | x | | | | xx | |
| 2014–15 | | x | | x | | | | x | |
| 2015–16 | | | | | | | | xx | |
| 2016–17 | x | | | | | | | xx | x |
| 2017–18 | | x | | | | | | x | |
| 2018–19 | | | x | x | | | | x | |
| 2019–20 | x | | | | | | | xxx | |
| 2020–21 | | | | | | x | | xxx | |
| 2021–22 | | | x | | | | | xxx | |
| 2022–23 | | | | | | x | | xxx | |
| 2023–24 | | | x | | | | | x | |
| 2024–25 | | | | | | | | x | |
| totals | 3 | 4 | 3 | 12 | 2 | 2 | 6 | 32 | 1 |

- BIO / BMA 560: Population Ecology. 3cr.
- BMA 567: Modeling of Biological Systems, with lab. 4cr.
- BMA / ST 590: Statistical Modeling in Ecology. 3cr.
- BMA772: Biomathematics II: Stochastic Modeling in the Life Sciences. 3cr.
- BMA 801: Biomathematics seminar. 1cr.
- BMA 815: Writing Science Effectively: Principles and Practice. 2cr.
- ST 380: Probability and Statistics for the Physical Sciences. 3cr.
- ST 512: Experimental Statistics for Biological Sciences II, with lab. 3cr.

- ST 524: Statistics in Plant Science, with lab. 3cr.

Other teaching:

- "Stochastic Modeling in Ecology", 1cr graduate short course in Enhancing Linkages between Math and Ecology (ELME) program at Kellogg Biological Station, an affiliate of Michigan State University. July 2017.

Recognition:

- "Thank-a-teacher" award recipient, 2011, 2012, 2013, 2015, 2018, 2019, 2021. (Student-nominated program "to allow students the opportunity to thank NC State professors who have gone above and beyond to make a difference in their lives")
- Departmental nominee for NCSU Outstanding Teaching Award, 2017

## Students and post-docs mentored

Post-docs:

1. Mordecai, Erin A. NSF Postdoctoral Research Fellow. co-mentored with Charles Mitchell (UNC-CH). January 2013 – December 2014.
2. Stone, Christopher M. NSF Postdoctoral Associate. December 2014 – June 2016.

Ph.D. students:

1. Canner, Judith. Ph.D. in Biomathematics and Zoology, 2010. Co-advised with Rob Dunn. Dissertation title: "The population ecology of ant-dispersed plants in space and time."
2. Fiske, Ian. Ph.D. in Statistics, 2012. Dissertation title: "Characterizing spatiotemporal trends in amphibian abundance using latent variable models." Non-thesis MS (Statistics) in 2008.
3. Backus, Gregory. Ph.D. in Biomathematics and Zoology, 2017. Co-advised with Nick Haddad. Dissertation title: "Population dynamics models of invasive rodent eradication with gene-drive technology." Non-thesis MBMA in 2014.

M.S. (Master of Science) students:

1. Hamilton, Matthew. MS in Biomathematics, 2007. Thesis: "Local dispersal and coexistence in a metacommunity model with trophic structure."
2. Allen, Shanae. MS co-major in Biomathematics with Operations Research (Y. Fathi, primary advisor), 2008. Thesis: "An integer programming approach to selecting individuals for transfer in pedigreed populations."
3. Lyzinski, Rebecca. MS in Biomathematics, 2011. Thesis: "Spatial dynamics of infection by multiple pathogens: A case study with yellow dwarf viruses"
4. Synder-Beattie, Andrew. MS in Biomathematics, 2013. Thesis: "Ecological theory and null models: Predicting the latitudinal biodiversity gradient with a view towards astrobiology."

5. Hall, Tessa. MS in Biomathematics, 2018. Thesis: "Size-structured population model for ocean acidification impacts through effects on demographic processes".

6. Freedman, Andrew. MS in Biomathematics and Entomology, 2024. Co-advised with George Kennedy. Thesis: "A variance-based global sensitivity analysis of the tomato spotted wilt virus pathosystem to elucidate the importance of fine-scale vector behaviors in seasonal plant virus epidemics".

Non-thesis Masters students:

1. Wu, Yabo. Master of Biomathematics completed 2006. Project: "Using first-order autoregressive models to approximate nonlinear birth-death processes"

2. Morris, Adam. Master of Statistics completed 2011.

3. Reeder, Amanda. Master of Biomathematics completed 2019. Project: "Vector-Autoregressive-Spatial-Temporal (VAST) Model Representation of Blue Crab (*Callinectes Sapidus*) Population Density in Pamlico Sound."

Undergraduates:

1. Kalendra, Eric. 2004–05. Project: Statistical methods for estimating abundance of rare butterflies. Awarded Best Poster for this work at NCSU's 2005 Undergraduate Research Symposium.

2. Weikel, Daniel. 2014. Project: Modeling the temperature dependence of vector transmission of disease.

Service on 82 additional graduate student committees.

## Service

Editorial service:

- Associate Editor, *Ecology Letters*, 2007 – 2013.
- Associate Editor, *Theoretical Ecology*, 2011 – 2017.
- Associate Editor, *The American Naturalist*, 2013 – 2022.
- Guest Subject Matter Editor, *Ecological Applications*, 2014.
- External D. Phil. examiner, James Cook University.
- Reviewer for *Agricultural and Forest Entomology, The American Naturalist, The American Statistician, Annals of Applied Statistics, Bayesian Analysis, Biocontrol, Biometrics, Biostatistics, Biotropica, Bulletin of Mathematical Biology, Computational Statistics and Data Analysis, Conservation Biology, Ecography, EcoHealth, Ecological Applications, Ecological Complexity, Ecology, Ecology Letters, Ecoscience, eLife, Field Methods, Frontiers in Ecology and the Environment, Integrative and Comparative Biology, Journal of Agricultural, Biological, and Environmental Statistics; Journal of Animal Ecology, Journal of Biological Dynamics, Journal of Mathematical Biology, Journal of the American Statistical Association, Journal of Theoretical Biology, Mathematical Biosciences, Methods in Ecology & Evolution, Nature, Nature Ecology & Evolution, Nature Machine Learning, Oecologia, Oikos,*

*Operations Research, PeerJ, PNAS, Proceedings of the Royal Society Series B, Quaternary Science Review, Royal Society Open Science, Science, Theoretical Ecology, Theoretical Population Biology, Transactions of the American Fisheries Society.*

Other service:

- Co-author of the R package `mvnmle` (multivariate normal maximum likelihood estimation).
- Co-organized oral session entitled: "What is the right size model? Views on model complexity and parsimony from different statistical paradigms." ESA, San Jose, CA, August 2007.
- Executive committee (elected), Theoretical Ecology Section of the Ecological Society of America, August 2009-11 (one-year term as vice chair followed by one-year term as chair).
- Co-organized Ignite oral session entitled: "Theory vs. empiricism in the advancement of science." ESA, Sacramento, CA, August 2014.
- NSF panel service (2007, 2010, 2011, 2012, 2013, 2014, 2016).
- WCU (World Class University) grant-review panel (2008, 2009, 2010).
- Mentor, ESA Theoretical Ecology section mentoring program, 2015 – 2016.
- Co-led professional development workshop for science faculty at the North Carolina School of Science and Math, 2022