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Education

B.S., Physics and Mathematics (*summa cum laude*), Yale University, Jan. 1990.

Ph.D., Zoology, Cambridge University, Nov. 1993. Dissertation: *Population Dynamics of Measles Epidemics in Developed Countries*. Supervisor: Dr. Bryan Grenfell

Employment

Professor 7/2010–present
Department of Mathematics & Statistics and Department of Biology, McMaster University.

Associate Professor 9/2005–6/2010
Assistant Professor 8/1999–8/2005
Department of Zoology (Biology), University of Florida.

Research Associate 10/93–8/99
Department of Ecology and Evolutionary Biology, Princeton University.

Grant funding (since 2018)

Semimechanistic models for ecology and epidemiology. NSERC Discovery. 1/Apr/2023 – 30/Mar/2028, \$284,000.

CANMOD: CANadian Network for MODelling infectious Disease. NSERC Emerging Infectious Diseases Modelling Initiative. Co-applicant. Full grant (David J. D. Earn, Caroline Colijn, co-PIs): 1/Aug/2021 – 31/Mar/2026. Subcontract to BMB/McMaster: \$70,000, 1/Aug/2021 – 31/Mar/2023.

Connecting theory with data in host-parasite evolution. NSERC. 1/Apr/2016 – 30/Mar/2023, \$215,000.

Collaborative Research: Linking predator functional diversity to prey dynamics through the functional response. NSF. 1/Sep/2016 - 31/Aug/2019. \$314,475.00. Collaborator. Co-PIs: James Vonesh, Michael McCoy, Jeremy Wojdak.

Professional service

Associate editor of *American Naturalist*.

Manuscript reviewer (including *Ecology*, *Ecology Letters*, *Nature*, *PNAS*, *Proc Roy Soc B*, *Science*), grants, books; grant panelist for NSF, Finnish Academy of Sciences.

Students

Current Ph.D. students: Michael Agronah, Allan Roberts

Current Master's students: Greg Forkutza

Ph.D. students graduated:

- University of Florida: John Poulsen, Toshinori Okuyama, Greg Babbitt (co-chair), Claudia Romero (co-chair), Jada-Simone White (co-chair), Zy Biesinger (co-chair), Swati DebRoy (Mathematics: co-chair), Mollie Brooks.
- McMaster University: Morgan Kain (Biology), Michael Li (Biology: co-chair)

Master's students (thesis): Evan Mitchell, Kala Studens (Statistics); Jennifer Freeman (Computational Science & Engineering)

Master's students (project): Keya Biswas; Michael Richard; Michael Li; Ahsan Bhatti (Statistics); Vivek Thampi (Math); Martin Stelmach, Jason Pecos (Computational Science & Engineering)

Articles published in peer-reviewed journals (since 2018)

- [1] M. A. Moritz, E. Batllori, and B. M. Bolker (2023) The role of fire in terrestrial vertebrate richness patterns. *Ecology Letters*, **26**:563–574.
- [2] S. Cygu, H. Seow, J. Dushoff, and B. M. Bolker (2023) Comparing machine learning approaches to incorporate time-varying covariates in predicting cancer survival time. *Scientific Reports*, **13**(1):1370.

- [3] S. W. Park, B. M. Bolker, S. Funk, C. J. E. Metcalf, J. S. Weitz, B. T. Grenfell, and J. Dushoff (2022) The importance of the generation interval in investigating dynamics and control of new SARS-CoV-2 variants. *Journal of the Royal Society Interface*, **19**(191):20220173.
- [4] M. W. McCoy, E. Hamman, M. Albecker, J. Wojdak, J. R. Vonesh, and B. M. Bolker (August 2022) Incorporating nonlinearity with generalized functional responses to simulate multiple predator effects. *PeerJ*, **10**:e13920.
- [5] A. Gharouni, F. Abdelmalek, D. J. Earn, J. Dushoff, and B. M. Bolker (2022) Testing and isolation efficacy: Insights from a simple epidemic model. *Bulletin of Mathematical Biology*, **84**:66.
- [6] D. P. Rosati, M. H. Woolhouse, B. M. Bolker, and D. J. D. Earn (September 2021) Modelling song popularity as a contagious process. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **477**(2253):20210457. Publisher: Royal Society.
- [7] S. W. Park, K. Sun, D. Champredon, M. Li, B. M. Bolker, D. J. Earn, J. S. Weitz, B. T. Grenfell, and J. Dushoff (2021) Forward-looking serial intervals correctly link epidemic growth to reproduction numbers. *Proceedings of the National Academy of Sciences*, **118**(2).
- [8] I. Papst, M. Li, D. Champredon, B. M. Bolker, J. Dushoff, and D. J. D. Earn (2021) Age-dependence of healthcare interventions for COVID-19 in Ontario, Canada. *BMC Public Health*, **21**:706.
- [9] N. A. Brown, N. S. Houpt, N. L. Yee, J. E. Curtis, B. M. Bolker, F. Juanes, and S. Balshine (2021) Consequences of nest site selection vary along a tidal gradient. *Journal of Animal Ecology*, **90**(2):528–541.
- [10] B. M. Bolker, M. R. Grasselli, and E. Holmes (2021) Sensitivity analysis of an integrated climate-economic model. *SIAM Journal on Financial Mathematics*, **12**(2):SC–44.
- [11] S. W. Park, B. M. Bolker, D. Champredon, D. J. Earn, M. Li, J. S. Weitz, B. T. Grenfell, and J. Dushoff (2020) Reconciling early-outbreak estimates of the basic reproductive number and its uncertainty: framework and applications to the novel coronavirus (SARS-CoV-2) outbreak. *Journal of the Royal Society Interface*, **17**(168):20200144.
- [12] S. W. Park and B. M. Bolker (2020) A note on observation processes in epidemic models. *Bulletin of Mathematical Biology*, **82**(3):1–8.
- [13] D. J. Earn, J. Ma, H. Poinar, J. Dushoff, and B. M. Bolker (2020) Acceleration of plague outbreaks in the second pandemic. *Proceedings of the National Academy of Sciences*, **117**(44):27703–27711.
- [14] B. M. Bolker, E. J. Bolker, and E. D. Bolker (2020) A curious possible prime pattern. *Mathematics Magazine*, **93**(2):132–135.
- [15] M. van de Kerk, D. P. Onorato, J. A. Hostetler, B. M. Bolker, and M. K. Oli (2019) Dynamics, persistence, and genetic management of the endangered Florida panther population. *Wildlife Monographs*, **203**(1):3–35.

- [16] M. Li, B. M. Bolker, J. Dushoff, J. Ma, and D. J. Earn (2019) Patterns of seasonal and pandemic influenza-associated health care and mortality in Ontario, Canada. *BMC Public Health*, **19**(1):1–9.
- [17] D. L. Karelus, J. W. McCown, B. K. Scheick, M. van de Kerk, B. M. Bolker, and M. K. Oli (2019) Incorporating movement patterns to discern habitat selection: black bears as a case study. *Wildlife Research*, **46**(1):76–88.
- [18] M. P. Kain and B. M. Bolker (2019) Predicting West Nile virus transmission in North American bird communities using phylogenetic mixed effects models and eBird citizen science data. *Parasites & Vectors*, **12**(1):1–22.
- [19] J. Dushoff, M. P. Kain, and B. M. Bolker (2019) I can see clearly now: Reinterpreting statistical significance. *Methods in Ecology and Evolution*, **10**(6):756–759.
- [20] M. Brooks, K. Kristensen, M. Darrigo, P. Rubim, M. Uriarte, E. Bruna, and B. Bolker (2019) Statistical modeling of patterns in annual reproductive rates. *Ecology*, p. e02706.
- [21] A. Shenkin, B. Bolker, M. Peña-Claros, J. C. Licona, N. Ascarrunz, and F. E. Putz (2018) Interactive effects of tree size, crown exposure and logging on drought-induced mortality. *Phil. Trans. R. Soc. B*, **373**(1760):20180189.
- [22] M. Li, J. Dushoff, and B. M. Bolker (2018) Fitting mechanistic epidemic models to data: A comparison of simple Markov chain Monte Carlo approaches. *Statistical Methods in Medical Research*, **27**:1956–1967.
- [23] M. P. Kain, I. M. Cattadori, and B. M. Bolker (2018) The evolutionary response of virulence to host heterogeneity: a general model with application to myxomatosis in rabbits co-infected with intestinal helminths. *Evolutionary Ecology Research*, **19**(3):257–278.
- [24] A. P. H. Bose, K. M. Cogliati, N. Luymes, A. H. Bass, M. A. Marchaterre, J. A. Sisneros, B. M. Bolker, and S. Balshine (2018) Phenotypic traits and resource quality as factors affecting male reproductive success in a toadfish. *Behavioral Ecology*, **29**:496–507.

Books

- [1] M. L. Wayne and B. M. Bolker (2023) *Infectious Disease: A Very Short Introduction*. Oxford University Press, 2 edn. 1st edition 2015.
- [2] B. M. Bolker (2008) *Ecological Models and Data in R*. Princeton University Press, Princeton, NJ.