

# CURRICULUM VITAE - RICHARD JOHN HALL

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## EDUCATION

- 2000-2004 PhD in Ecological Modeling, Department of Plant Sciences, Cambridge University, UK (Advisors: Professor Christopher Gilligan, Dr Simon Gubbins)
- 1999-2000 MSc in Mathematical Modeling and Scientific Computing, Centre for Mathematical Biology, Oxford University, UK (Advisors: Professor Philip Maini, Dr Andrew Fowler)
- 1996-1999 BA in Mathematical Sciences, Mathematical Institute, Oxford University, UK
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## PROFESSIONAL POSITIONS

- 2022-present Associate Professor, Odum School of Ecology and Department of Infectious Diseases, College of Veterinary Medicine, University of Georgia (UGA), Athens, USA
- 2017-2022 Assistant Professor, Odum School of Ecology and Department of Infectious Diseases, College of Veterinary Medicine, UGA
- 2016-2017 Associate Research Scientist, Odum School of Ecology and Department of Infectious Diseases, College of Veterinary Medicine, UGA
- 2013-2016 Assistant Research Scientist, Odum School of Ecology and Department of Infectious Diseases, College of Veterinary Medicine, UGA
- 2009-2012 Temporary Assistant Research Scientist, Odum School of Ecology, UGA
- 2008 Microsoft Research Fellow, University of Cambridge, UK
- 2006-2007 Postdoctoral Researcher, Laboratory of Ecology, Systematics and Evolution Université Paris-Sud XI, France (Mentor: Dr Franck Courchamp)
- 2004-2005 Postdoctoral Researcher, Department of Environmental Science and Policy University of California, Davis, USA (Mentor: Professor Alan Hastings)
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## PUBLICATIONS

Asterisks indicate lead, senior or co-senior authorship; superscripts u, g, or p indicate undergraduate, graduate student or postdoc mentee co-authors respectively.

### i. Books Edited

- (1) \*Ezenwa, VO, Altizer, S and **Hall, RJ** (2022) *Animal Behavior and Parasitism*, Oxford University Press.

## ii. Book Chapters

- (5) \***Hall, RJ**, Altizer, S, Peacock, SJ and Shaw, AK (2022) Animal migration and infection dynamics: recent advances and future frontiers. In: *Animal Behavior and Parasitism*, Ezenwa, VO, Altizer, S and **Hall, RJ** (eds), Oxford University Press.
- (4) \*Ezenwa, VO, Altizer, S and **Hall, RJ** (2022) Animal behavior and parasitism: where have we been, where are we going? In: *Animal Behavior and Parasitism*, Ezenwa, VO, Altizer, S and **Hall, RJ** (eds), Oxford University Press.
- (3) \***Hall, RJ** (2021) Climate Change and Avian Disease. In: *Infectious Disease Ecology of Wild Birds*, Owen, JC, Hawley, DM, and Huyvaert, KP (eds), Oxford University Press.
- (2) \*Altizer, S, Teitelbaum, CS<sup>g</sup> and **Hall, RJ** (2019) Animal Migration and Parasitism. In: *Encyclopedia of Animal Behavior* (2<sup>nd</sup> edition), Choe JC (ed): Academic Press.
- (1) \***Hall, RJ** (2012) Restoration Ecology. In: *Encyclopedia of Theoretical Ecology*, Hastings, A and Gross, LJ (eds), University of California Press.

## iii. Journal Special Issues Edited

- (1) \*Becker, DJ<sup>g</sup>, **Hall, RJ**, Forbes, KM, Plowright, RK<sup>g</sup> and Altizer, S (2018) Anthropogenic Resource Subsidies and Host-Parasite Dynamics in Wildlife. *Philosophical Transactions of the Royal Society B*.

## iv. Journal Articles

- (61) \*Ragonese, IG<sup>g</sup>, Sarkar, M<sup>u</sup>, **Hall, RJ** and Altizer S. Extreme heat reduces host and parasite performance in a butterfly-parasite interaction. In press, *Proceedings of the Royal Society B*
- (60) Dayer AA, Pototsky PC, **Hall RJ**, Hawley DM, Phillips TB, Bonter DN, Dietsch AM, Greig E, and Hochachka WM (2023). Birds are not the only ones impacted by guidance to cease bird feeding. *People and Nature*. <https://doi.org/10.1002/pan3.10566>
- (59) Irwin BJ, Tomamichel MM<sup>g</sup>, Frischer ME, **Hall RJ**, Davis AE, Bliss TH, Rohani P, and Byers JE (2023) Managing the threat of infectious disease in fisheries and aquaculture using structured decision making. *Frontiers in Ecology and the Environment*. <https://doi.org/10.1002/fee.2695>
- (58) Trillo PA, Bernal XE and **Hall RJ** (2023) Mixed-species assemblages and disease: the importance of differential vector and parasite attraction in transmission dynamics. *Philosophical Transactions of the Royal Society B* 378: 20220109
- (57) \*Teitelbaum CS<sup>g</sup>, Bachner NC<sup>u</sup> and **Hall RJ** (2023) Post-migratory nonbreeding movements of birds: A review and case study. *Ecology and Evolution* 13: e9893
- (56) Tomamichel, MM<sup>g</sup>, Walters, TL, **Hall, RJ**, Byers, JE and Frischer, ME (2023) A Methodology to Produce Specific-Pathogen-Free Penaeid Shrimp for Use in Empirical Investigations of Parasite Ecology. *Journal of Shellfish Research* 42: 133-142.
- (55) \*Teitelbaum, CS<sup>g</sup>, Altizer, S and **Hall, RJ** (2022) Habitat specialization by wildlife reduces pathogen spread in urbanizing landscapes. *The American Naturalist* 199: 238-251.
- (54) \*Vinson, JE<sup>p</sup>, Gottdenker, NL, Chaves, LF, Kaul, RB, Kramer, AM, Drake, JM and **Hall, RJ** (2022) Land reversion and zoonotic spillover risk. *Royal Society Open Science* 9: 220582.
- (53) \*Arnold, ZJ<sup>g</sup>, Wenger, S, and **Hall, RJ** (2021) Not just trash birds: Quantifying avian diversity at landfills using community science data. *PLoS One* 16: e0255391.
- (52) \*Vinson, JE<sup>g</sup>, Park, AW, Cleveland, CA, Yabsley, MJ, Ezenwa, VO and **Hall, RJ** (2021) Alternative transmission pathways for guinea worm in dogs: implications for outbreak risk and control., *International Journal for Parasitology* 51: 1027-1034.

- (51) Kernbach, ME<sup>g</sup>, Martin, LB, Unnasch, TR, **Hall, RJ**, Jiang, RHY and Francis, CD (2021) Light pollution affects West Nile virus exposure risk across Florida. *Proceedings of the Royal Society B* 288, 20210253.
- (50) \*Teitelbaum, CS<sup>g</sup>, Hepinstall-Cymerman, J, Kidd-Weaver<sup>g</sup>, A, Hernandez, S and **Hall, RJ** (2020) Urban specialization reduces habitat connectivity by a highly mobile wading bird. *Movement Ecology* 8:1-13.
- (49) \*Sánchez, CA<sup>g</sup>, Altizer, S and **Hall RJ** (2020) Landscape-level toxicant exposure mediates infection impacts on wildlife populations. *Biology Letters* 16: 20200559.
- (48) \*Becker, DJ<sup>g</sup>, Ketterson, ED and **Hall, RJ** (2020) Reactivation of latent infections with migration shapes population-level disease dynamics. *Proceedings of the Royal Society B* 287, 20201829.
- (47) \*Teitelbaum, CS<sup>g</sup>, Altizer, S and **Hall, RJ** (2020) Movement rules determine nomadic species' responses to resource supplementation and degradation. *Journal of Animal Ecology* 89: 2644-2656.
- (46) Richards, RL, Cleveland, CA, **Hall, RJ**, Ouakou, PT, Park, AW, Ruiz-Tiben, E, Weiss, A, Yabsley, MJ and Ezenwa, VO (2020) Identifying drivers of Guinea worm (*Dracunculus medinensis*) infection in dogs. *PLoS Neglected Tropical Diseases* 14, e0008620.
- (45) Miazgowicz, KL<sup>g</sup>, Mordecai, EA, Ryan, SJ, **Hall, RJ** et al. (2020) Mosquito species and age influence thermal performance of traits relevant to malaria transmission. *Proceedings of the Royal Society B* 287, 20201093.
- (44) \***Hall, RJ** (2019) Modeling the effects of resource-driven immune defense on parasite transmission in heterogeneous host populations. *Integrative and Comparative Biology* 59, 1253-1263.
- (43) \*Majewska, AA<sup>g</sup>, Sims, S, Schneider, A<sup>u</sup>, Altizer, S and **Hall, RJ** (2019) Multiple transmission routes sustain high prevalence of a virulent parasite in a butterfly host. *Proceedings of the Royal Society B* 286, 20191630.
- (42) Kernbach, ME<sup>g</sup>, Miller, JM, **Hall, RJ**, Unnasch, TR, Burkett-Cadena, ND and Martin LM (2019) Light pollution increases West Nile Virus competence of a ubiquitous passerine reservoir species. *Proceedings of the Royal Society B* 286, 20191051.
- (41) Laughlin, AJ, **Hall, RJ**, & Taylor, CM (2019) Ecological determinants of pathogen transmission in communally roosting species. *Theoretical Ecology* 12, 225-235.
- (40) Dayer, AA, Rosenblatt, C, Bonter, DN, Faulkner, H, **Hall, RJ**, Hochachka, WM, Phillips, TB and Hawley, DM (2019) Observations at backyard bird feeders influence the emotions and actions of people that feed birds. *People and Nature* 1, 138-151.
- (39) Niedringhaus, KD, Burchfield, HJ, Elsmo, EJ, Cleveland, CA, Fenton, H, Shock, BC, Muise, C, Brown, JD, Munk, B, Ellis, A, **Hall, RJ** and Yabsley, MJ (2019) Trichomonosis due to *Trichomonas gallinae* infection in barn owls (*Tyto alba*) and barred owls (*Strix varia*) from the eastern United States. *Veterinary Parasitology: Regional Studies and Reports* 16, 100281.
- (38) \*Becker, DJ<sup>g</sup>, Teitelbaum, CS<sup>g</sup>, Murray, MH, Curry, SE, Welch, CN, Ellison, T, Adams, HC, Rozier, RS, Lipp, EK, Hernandez, SM, Altizer, S, and **Hall, RJ** (2018) Assessing the contributions of intraspecific and environmental sources of infection in urban wildlife: *Salmonella enterica* and white ibis as a case study. *Journal of the Royal Society Interface* 15, 20180654.
- (37) \*Sánchez, CA<sup>g</sup>, Becker, DJ<sup>g</sup>, Teitelbaum, CS<sup>g</sup>, Barriga, P, Brown, LM<sup>p</sup>, Majewska, AA<sup>g</sup>, **Hall, RJ** and Altizer, S (2018) On the relationship between body condition and parasite infection in wildlife: a review and meta-analysis. *Ecology Letters* 21,1869-1884.

- (36) \*Becker, DJ<sup>g</sup>, Snedden, CE<sup>u</sup>, Altizer, S and **Hall, RJ** (2018) Host dispersal responses to resource supplementation determine pathogen spread in wildlife metapopulations. *The American Naturalist* 192, 503-517.
- (35) Kernbach, ME<sup>g</sup>, **Hall, RJ**, Burkett-Cadena, ND, Unnasch, T and Martin, LB (2018) Dim light at night: physiological effects and ecological consequences for infectious disease. *Integrative and Comparative Biology* 58, 995-1007.
- (34) \*Becker, DJ<sup>g</sup>, **Hall, RJ**, Forbes, KM, Plowright, RK and Altizer S (2018) Anthropogenic resource subsidies and host-parasite dynamics in wildlife. *Philosophical Transactions of the Royal Society B* 373, 20170086 (co-editor of invited special issue).
- (33) \*Brown, LM<sup>p</sup> and **Hall, RJ** (2018) Consequences of resource supplementation for disease risk in a partially migratory population. *Philosophical Transactions of the Royal Society B* 373: 20170095.
- (32) Altizer, S, Becker, DJ<sup>g</sup>, Epstein, JH, Forbes, KM, Gillespie, TR, **Hall, RJ**, Hawley, DM, Hernandez, SM, Martin, LB, Plowright, RK, Satterfield, DA<sup>g</sup>, and Streicker, DG (2018) Food for contagion: synthesis and future directions for studying host–parasite responses to resource shifts in anthropogenic environments *Philosophical Transactions of the Royal Society B* 373, 20170102.
- (31) \*Teitelbaum, CS<sup>g</sup>, Huang, S, **Hall, RJ** and Altizer, S (2018) Migratory behavior predicts greater parasite diversity in ungulates. *Proceedings of the Royal Society B* 285, 20180089.
- (30) \*Gehman, ALM<sup>g</sup>, **Hall, RJ** and Byers, JE (2018) Host and parasite thermal ecology jointly determine the effect of climate warming on epidemic dynamics. *Proceedings of the National Academy of Sciences* 115, 744-749.
- (29) \*Hoffberg, SL<sup>g</sup>, Mauricio, R and **Hall, RJ** (2018) Control or re-treat? Model-based guidelines for managing established plant invasions. *Biological Invasions* 20, 1387-1402.
- (28) \*Satterfield, DA<sup>g</sup>, Williams, M<sup>u</sup>, Altizer, S and **Hall, RJ** (2017) Environmental persistence influences infection dynamics for a butterfly pathogen. *PLoS One* 12, e0169982.
- (27) \***Hall, RJ**, Brown, LM<sup>p</sup> and Altizer, S (2016) Modeling vector-borne disease risk in migratory animals under climate change. *Integrative and Comparative Biology* 56, 353-364.
- (26) \***Hall, RJ** (2016) Hybridization helps colonizers become conquerors. *Proceedings of the National Academy of Sciences* 113: 9963-9964 (peer-reviewed invited commentary).
- (25) Murray, MH, Becker, DJ<sup>g</sup>, **Hall, RJ** and Hernandez, SM (2016) Wildlife Health and supplemental feeding: a review and management recommendations. *Biological Conservation* 204, 163-174.
- (24) \*Taylor, CM, Laughlin, AJ and **Hall, RJ** (2016) The response of migratory populations to phenological change: a Migratory Flow Network modeling approach. *Journal of Animal Ecology* 85, 648-659.
- (23) \*Becker, DJ<sup>g</sup> and **Hall, RJ** (2016) Heterogeneity in patch quality buffers metapopulations from pathogen impacts. *Theoretical Ecology* 9, 197-295.
- (22) Dallas, T<sup>g</sup>, **Hall, RJ** and Drake, JM (2016) Competition-mediated feedbacks in experimental multi-species epizootics. *Ecology* 97, 661-670.
- (21) \***Hall, RJ**, Altizer, S and Bartel RA (2014) Greater migratory propensity in hosts lowers pathogen transmission and impacts. *Journal of Animal Ecology* 83, 1068-1077.
- (20) Rushmore, J<sup>g</sup>, Caillaud, D, **Hall, RJ**, Stumpf, RM, Meyers, LA and Altizer, S. (2014) Network-based vaccination improves prospects for disease control in wild chimpanzees. *Journal of the Royal Society Interface* 11, 20140349.

- (19) \*Becker, DJ<sup>§</sup> and **Hall, RJ** (2014) Too much of a good thing: resource provisioning alters infectious disease dynamics in wildlife. *Biology Letters* 10: 20140309 (This was the journal's most cited paper in 2020).
- (18) \*Breithaupt, M<sup>u</sup>, Davis, AK and **Hall, RJ** (2013) A preliminary survey of birds killed by window collisions in Georgia based on museum specimens. *The Oriole* 77, 10-18.
- (17) \*Taylor, CM and **Hall, RJ** (2012) Metapopulation models for seasonally migratory animals. *Biology Letters* 8, 477-480.
- (16) \***Hall, RJ** (2011) Eating the competition speeds up invasions. *Biology Letters* 7, 307-311.
- (15) \***Hall, RJ** (2011) Intraguild predation in the presence of a shared natural enemy. *Ecology* 92, 352-361.
- (14) \*Ware, RL, Michie, LJ, Otani, T, Rhule, E and **Hall, RJ** (2010) Adaptation of native parasitoids to a novel host: the invasive coccinellid *Harmonia axyridis*. *IOBC Bulletin* 58, 175-182.
- (13) \***Hall, RJ** and Ayres, DR (2009) What can mathematical modeling tell us about hybrid invasions? *Biological Invasions* 11, 1217-1224.
- (12) \***Hall, RJ**, Ware, RL and Michie, LJ (2009) First record of field parasitism of immature stages of the Harlequin Ladybird *Harmonia axyridis* (Pallas) (Col.: Coccinellidae) by the braconid wasp *Dinocampus coccinellae* (Shrank) (Hym.: Braconidae). *The Entomologist's Record* 121, 57-58.
- (11) Michie, LJ, Disney, RHL, **Hall, RJ**, Ware, RL and Majerus, MEN (2009). First occurrence of Phoridae (Diptera) and live *Harmonia axyridis* (Pallas) (Col.: Coccinellidae) eclosing from the same pupae. *The Entomologist's Record* 121, 68-69.
- (10) \***Hall, RJ**, Ware, RL, Michie, LJ, Brown, P and Majerus MEN (2009) First occurrence of *Rhyzobius chrysomeloides* (Herbst) (Col.: Coccinellidae) in Cambridgeshire. *The Entomologist's Record* 121, 78.
- (9) \***Hall, RJ**, Milner-Gulland, EJ and Courchamp, F (2008) Endangering the endangered: the effects of perceived rarity on species exploitation. *Conservation Letters* 1, 75-81.
- (8) \***Hall, RJ** and Hastings, A (2007) Minimizing invader impacts: striking the right balance between removal and restoration. *Journal of Theoretical Biology* 249, 437-444.
- (7) Rivalan, P, Delmas, V, Angulo, E, Bull, LS, **Hall, RJ**, Courchamp, F, Rosser, AM and Leader-Williams, N (2007) Can bans stimulate wildlife trade? *Nature* 447, 529-530.
- (6) \***Hall, RJ**, Gubbins, S and Gilligan, CA (2007) Evaluating the performance of chemical control in the presence of resistant pathogens. *Bulletin of Mathematical Biology* 69, 525-537.
- (5) Melbourne, BA, Cornell, HV, Davies, KF, Dugaw, CJ, Elmendorf, S, Freestone, AL, **Hall, RJ**, Harrison, S, Hastings, A, Holland, M, Holyoak, M, Lambrinos, J, Moore, K, Yokomizo, H (2007) Invasion in a heterogeneous world: resistance, coexistence or hostile takeover? *Ecology Letters* 10, 77-94.
- (4) Courchamp, F, Angulo, E, Rivalan, P, **Hall, RJ**, Signoret, L, Bull, L and Meinard, Y (2006) Rarity value and species extinction: the anthropogenic Allee effect. **PLoS Biology** 4, 2405-2410. (A 'must-read' paper on Faculty of 1000 Biology website; article spotlighted in Nature news and views).
- (3) Hastings, A, **Hall, RJ** and Taylor, CM (2006) A simple approach to optimal control of invasive species. **Theoretical Population Biology** 70, 431-435.
- (2) \***Hall, RJ**, Hastings, A and Ayres, DR (2006) Explaining the explosion: modelling hybrid invasions. *Proceedings of the Royal Society B* 273, 1385-1389.

(1) \***Hall, RJ**, Gubbins, S and Gilligan, CA (2004). Invasion of drug and pesticide resistance is determined by a trade-off between treatment efficacy and relative fitness. *Bulletin of Mathematical Biology* 66, 825-840.

#### v. Journal Articles in Review

(2) Mistrick, J, Kitchen, SM, Veitch, JSM, Clague, S, Newman, BC, **Hall, RJ**, Budishak, SA, Forbes, KM, and Craft, ME. Effects of food addition and helminth removal on space use and spatial overlap in wild rodent populations. In revision, *Journal of Animal Ecology*. Preprint: <https://www.biorxiv.org/content/10.1101/2022.12.22.521674v1>

(1) \*Wilson, CA<sup>g</sup>, Hernandez, S, Weil, JN<sup>u</sup>, Ezenwa, VO, Altizer S and **Hall, RJ**. Human-provided food increases aggregation but does not change activity budgets in an urban wading bird. In review, *Journal of Urban Ecology*

#### vi. Other Scientific Communications

(5) \***Hall RJ**, Holzman RE, Holzman S and Winn B (2022). First record of an “Ipswich” Savannah Sparrow eating fungus on St Catherines Island, Liberty Co., Georgia. *The Oriole* 87: 35-37.

(4) \***Hall, RJ** From the Field, (quarterly report of noteworthy bird records in Georgia for the journal of the Georgia Ornithological Society) *The Oriole*, 2010-16.

(3) Sattelmeyer, RM, **Hall RJ** and Southern, J Southern Atlantic Regional Report (quarterly) for *North American Birds*, 2011-16.

(2) \***Hall, RJ**, Hastings, A and Ayres, DR (2010) Modeling the spread of invasive *Spartina* hybrids in San Francisco Bay, in *Proceedings of the Third International Conference on Invasive Spartina*, California State Coastal Conservancy, 117-120.

(1) Bunnefeld, N, Börger, L, Nilsen, EB, Basille, M, **Hall, RJ**, Ezard, THG, Trierweiler, C, Minderman, J, Mangel, M, Gaillard, J-M, Milner-Gulland, EJ et al. (2007) Coming out of the ivory tower: how to ensure that ecological modelling research remains practical and applied. *British Ecological Society Bulletin*, December 1<sup>st</sup> issue.

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## GRANTS

### i. Research Grants

For each collaborative grant below, I co-developed the conceptual framework, led the mathematical modeling components, wrote the corresponding proposal sections, and oversaw theory development and associated mentorship of postdoc and student trainees. Additionally, a grant I submitted as lead PI in 2019 to the *National Science Foundation Macrosystems Biology* panel, “Migratory Flow Networks: A Unifying Theory for Animal Migration Linking Local and Macroscale Processes”, was ranked high priority for invite by the panel, but not awarded due to existing support.

(9) *National Science Foundation, Dynamics of Integrated Socio-Environmental Systems* (2023-2026). “Using continent-wide participatory science to model the dynamic outcomes for humans and birds in a socio-environmental system” co-PI with A. Dayer (lead), D. Hawley, D. Bonter and A. Dietsch (\$1.6 million; amount to Hall \$158,140).

(8) *NOAA Georgia Sea Grant* (2020-2022). “Optimizing Georgia’s shrimp fishery in the age of black gill”. Co-PI with M. Frischer (lead) K. Johnsen and J. Byers (\$231,200; amount to Hall \$57,800).

(7) *National Science Foundation, Dynamics of Integrated Socio-Environmental Systems* (2019-2024). “Social and ecological determinants of multi-host vector-borne infections in dynamic tropical landscapes”.

Senior Personnel with N. Gottdenker (lead), J. Drake, S. Tanner, J.P. Schmidt, S. Altizer. and J. Velásquez-Runk (\$1.6m; estimated total direct costs to Hall \$192,000).

(6) *National Science Foundation, Ecology and Evolution of Infectious Diseases* (2019-2024). “Habitat and coinfection as drivers of heterogeneity in cross-scale wildlife infectious disease processes.” Co-PI with K. Forbes (lead), S. Budishak, and C. Cressler (\$2.5 million; amount to Hall \$236,238).

(5) *UGA President’s Interdisciplinary Seed Grant* (2019-2020). “Mitigating disease impacts in fisheries: adaptive strategies to ensure a safe, healthy seafood supply”. Co-PI with J. Byers (lead) and M. Frischer (\$127,403; amount to Hall \$42,468).

(4) *National Science Foundation, Population and Community Ecology* (2018-2024). “How do shifts from migratory to sedentary behavior alter host-parasite dynamics?” Co-PI with S. Altizer (lead), J. De Roode, K. Oberhauser and C. Taylor (\$423,342; amount to Hall \$127,003).

(3) *The Carter Center* (2017-2019). “Investigating the spatial and temporal drivers of *Dracunculus medinensis* epidemiology in Chad.” Co-PI with M. Yabsley (lead), V. Ezenwa and A. Park, (\$90,362; amount to Hall \$22,658).

(2) *UGA President’s Interdisciplinary Seed Grant* (2017-2018). “Spillover: the geography of emerging infectious diseases.” Co-PI with J. Drake (lead), A. Kramer, P. Stephens, S. Ferreira, JP Schmidt, N. Gottdenker and S. Bellan (\$109,746; amount to Hall \$15,678).

(1) *National Science Foundation, Ecology and Evolution of Infectious Diseases* (2015-2023). “Consequences of Anthropogenic Resources for the Cross-Scale Dynamics of an Enteric Pathogen in an Avian Host.” Co-PI with S. Hernandez (lead), S. Altizer, J. Hepinstall, and K. Navara (\$2.14 million; amount to Hall \$214,144).

## **ii. Other Grants and Research Awards**

(9) *National Science Foundation, Ecology and Evolution of Infectious Diseases* (2020-2022). “Symposium: Research Frontiers in Animal Behavior and Parasitism 2020”. Co-PI with S. Altizer (lead) and V. Ezenwa (\$19,990 to organize and host symposium of 120 early-career and senior scientists from across the world).

(8) *National Science Foundation, Graduate Research Traineeship* (2015-2021). “Interdisciplinary Disease Ecology Across Scales: from Byte to Benchtop to Biosphere.” Named Participating Faculty (wrote sections of proposal); PIs V. Ezenwa (lead), J. Drake and D. Krause. (total award amount \$3 million to develop cross-disciplinary Ph.D. training program in infectious disease ecology).

(7) *National Science Foundation Short-term Visitor Award* (2013) for international collaboration at National Institute for Mathematical and Biological Synthesis (NIMBioS). (\$5000). “Migratory network theory, monarch butterfly declines and response to environmental change.” Organizer.

(6) *National Science Foundation Short-term Visitor Award* (2010) for international collaboration at NIMBioS (\$10,000). “Modeling the effects of habitat fragmentation and biotic resistance on biological invasions.” Organizer.

(5) Cambridge University Philosophical Society Research Studentship (2003) awarded for exceptionally promising doctoral research (\$1500).

(4) Frank Smart Studentship, Cambridge University (2002 and 2003) awarded for exceptional progress in research in the biological sciences (\$3,500).

(3) Best research poster, Society for Mathematical Biology annual meeting (2002).

(2) Biotechnology and Biological Sciences Research Council UK Graduate Research Assistantship (2000), total award value ~\$25,000.

(1) Engineering and Physical Sciences Research Council UK Graduate Research Assistantship (1999), total award value ~\$7,000.

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## PROFESSIONAL PRESENTATIONS

### i. Conferences and Symposia Organized

- 2023 Discussion Leader, Invasions and Outbreaks, Gordon Conference on Movement Ecology of Animals, Lucca, Italy
- 2021 Virtual Symposium Co-organizer, Research Frontiers in Animal Behavior and Parasitism
- 2016 Symposium Co-organizer, Resource Provisioning and Wildlife-Pathogen Interactions in Human-altered Landscapes. Annual Meeting, Ecological Society of America (ESA), Fort Lauderdale, FL
- 2015 Steering Committee Member, 13<sup>th</sup> annual conference on the Ecology and Evolution of Infectious Diseases, Athens, GA
- 2011 Organized Oral Session Organizer, Infectious Disease Dynamics in Migratory Species. ESA Annual Meeting, Austin, TX

### ii. Invited University Seminars and Talks

- 2023 The Mathematics of Disease Outbreaks, Math Club, UGA  
Migration-infection feedbacks, Ecology Theory Lunch, UGA
- 2022 The effects of food subsidies on wildlife infectious disease. EEB seminar, University of Connecticut  
Animal movement and One Health. One Health Club, UGA
- 2021 Wildlife disease in the Anthropocene: the consequences of resource subsidy and stabilization. Biology Seminar, Winthrop University  
Resource stabilization and its cross-scale consequences for infection dynamics in wildlife. Ecology seminar, UGA
- 2020 Anthropogenic food subsidy and wildlife disease. EEID virtual seminar series, UC Berkeley  
Anthropogenic food subsidies as a cross-scale driver of wildlife disease dynamics. E3B Seminar, Columbia University
- 2019 Animal movement in the Anthropocene and its consequences for parasitism. Population Biology Ecology and Evolution Seminar, Emory University  
Food as a cross-scale driver of wildlife disease dynamics. Biology Seminar, Indiana University
- 2018 Shifts in migratory behavior and parasitism: monarch butterflies as a case study. 2018. Biology Seminar, Kennesaw State University  
Loss of migration and infection dynamics in North American monarch butterflies. Entomology Seminar, Penn State University
- 2017 Are easy meals disease-y meals? Modeling the consequences of food subsidies for animal movement and disease risk. Biology Seminar, University of South Florida  
Marvelous migration: might mathematical modeling manifest mechanisms menacing migrants? Organization for Tropical Studies Faculty Seminar, La Selva, Costa Rica



- Diet, disease and dispersal: linking resource distribution to animal movement and infectious disease dynamics under global change. Biology Seminar, Virginia Tech
- 2015 Integrating resource distribution, animal movement and infectious disease dynamics. Ecology Seminar, UGA
- Diet, dispersal and disease: how resources influence pathogen dynamics from individuals to landscapes. Infectious Diseases Summer Seminar, UGA
- 2013 Fatal attraction: the overexploitation of rare species. Conservation Seminar, UGA
- 2012 Menace on the move: invasive intraguild predators and migratory host-pathogen interactions. Ecology Seminar, UGA
- Optimal control of invasive species: a novel application of linear programming. Applied Mathematics Seminar, UGA
- 2010 Sick moves: can disease influence migration patterns? Enthusiasts of Genetics, Diversity and Evolution Seminar, UGA
- Does disease influence migration patterns? Computational Ecology and Epidemiology Study Group, UGA
- 2008 From biological invasions to rare species exploitation: modeling approaches to man-made problems. Ecology Seminar, UGA

### iii. Invited conference talks

- 2023 Drivers of migratory and nomadic movements in waterbirds, and their consequences for pathogen transmission. Waterbird Society Meeting, Fort Lauderdale, FL
- 2022 Using movement data and models to quantify habitat specialization and its consequences for infection in White Ibis in an urbanizing landscape. The Wildlife Society Annual Meeting, Spokane, WA
- 2021 Connecting disease with movement ecology in humans and animals: an integrated approach. ESA annual meeting (virtual)
- 2019 Responses of animal migration to environmental change and consequences for parasite transmission. Gordon Conference on the Movement Ecology of Animals, Lucca, Italy
- Modeling the effects of resource acquisition on immune defense and infection dynamics in heterogeneous host populations. Immunology across scales symposium, Society of Integrative and Comparative Biology (SICB) Annual Meeting, Tampa, FL
- 2018 Investigating the local, regional, and seasonal drivers of *Dracunculus medinensis* emergence in dogs in Chad. Carter Center Guinea worm symposium, Atlanta, GA
- 2016 Setting the table for wildlife disease outbreaks: resource provisioning, pathogen transmission, and disease emergence in humans and wildlife. ESA Annual Meeting, Fort Lauderdale, FL
- Climate warming modulates pathogen transmission in migratory species by altering overlap with disease vectors. SICB Annual Meeting, Portland, OR
- 2011 Sick moves: modeling disease-induced changes to migration patterns. ESA Annual Meeting, Austin, TX
- 2006 Rare species exploitation and the Anthropogenic Allee Effect. French National Research Agency (ANR) colloquium, Nancy, France.
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## TEACHING

### i. Awards and Recognition

Odum School of Ecology Faculty Instructor of the Year (2020)

### ii. Media articles on Teaching

[Service-learning: Odum students changing the landscape](#) *EcoVoice* (Odum School alumni magazine)

[Focus on Faculty: Richard Hall](#) *UGA News*

### iii. Graduate Courses

All classes or modules below were developed at UGA unless indicated.

*Topics in Modern Ecology* (2018-present; enrollment ~12). Designed a module on introduction to ecological modeling, focusing on how to translate an ecological question into a mathematical model.

*Problems in Ecology* (2020; enrollment 12 students). Discussion-based seminar on the topic of animal behavior and parasitism.

*Interdisciplinary Problem-Solving in Infectious Disease Ecology* (2019; enrollment 10). Students worked in teams to develop a research project and a related policy or outreach/educational product.

*Field Ecology: Skills for Science and Beyond* (2017; enrollment 12), Guest instructor, Organization for Tropical Studies, La Selva, Costa Rica. Developed materials on food subsidy effects on wildlife and oversaw field project estimating effects of food subsidy on avian communities.

*Global Change and Vector-borne Diseases* (2015; enrollment 6). Journal club on recent theoretical and empirical advances in how diverse vector-borne diseases respond to climate and land-use change.

### iv. Undergraduate Courses

*Conservation Biology* (2 sections annually since 2011; enrollment ~100) Junior-level class covering the theory and practice of modern conservation through a multi-disciplinary lens.

*Environmental Practicum* (2018-present; enrollment ~15) A service-learning class where seniors translate ecological theory into practice through environmental projects developed with diverse stakeholders.

*Field Program in Ecological Problem-Solving* (2016-17; enrollment ~15) Students visit the major ecoregions of Georgia to learn how human and natural communities are responding to climate change.

*Field Ornithology in Costa Rica* (2013-2015 enrollment ~6). Introduction to the diversity, ecology and conservation of birds in diverse tropical ecosystems.

*Directed Reading in Ecology* (2012-present; enrollment 1-2). Reading topical papers on themes decided by students, including avian disease ecology and mathematical ecology.

### v. Invited Guest Lecturer (all UGA unless stated)

*Graduate classes (n=5)*

Mathematical Modeling of Infectious Diseases; Conservation Seminar; Disease Ecology (U. Arkansas); Ecology in English (Université Paris-Sud); Mathematical Methods in Population Biology (UC Davis)

*Undergraduate classes (n=9)*

Population and Community Ecology; Ecology; Evolutionary Ecology; Urban Ecology; Tropical Ecology; Freshman Odyssey into the Natural Sciences; Freshman Odyssey into Infectious Diseases; Unraveling the Mysteries of Animal Migration; Population Ecology (UC Davis)

### vi. Other relevant instructional experience

*Workshop organizer:* Introduction to non-dimensionalization of ecological and epidemiological models (modeling workshop for UGA students, postdocs and faculty)

*Teaching Assistant:* Quantitative Biology; Evolution and Behavior (Cambridge University)

## **MENTORING**

### **i. Awards, Training and Recognition**

Graduate School Outstanding Mentoring Award (nominated by mentees, 2021)

UGA Career Center Certificate (awarded) recognizing outstanding contributions to career development of UGA graduates (2018, 2021 and 2023)

UGA Center for Undergraduate Research Opportunity Research Mentoring Award (nominated by mentees, 2020).

Training: completed mentorship and instruction training modules including: Diversity at UGA Beyond The Numbers, LGBTQ Safe Space training, implicit bias, managing faculty-mentee dynamics, mentor-mentee compacts, syllabus construction, and active learning.

### **ii. Supervision of Postdoctoral Research (n=2)**

John E. Vinson (2020-2022). Dr. Vinson was supported by an NSF Dynamics of Integrated Socio-Ecological Systems grant to develop mathematical models of land use change and vector-borne diseases. Dr. Vinson is now a postdoctoral researcher at Southern Illinois University.

Leone M. Brown (2015-2017). Dr. Brown was supported by an NSF Mathematical Biology Postdoctoral Training Fellowship to develop models of migratory host-pathogen dynamics under global change. Dr. Brown is now an Assistant Professor at James Madison University.

### **iii. Supervision of Graduate Student Research (n=7; in reverse chronological order)**

Ecology = Odum School of Ecology; CESD = Conservation Ecology and Sustainable Development MS; IDEAS = Interdisciplinary Disease Ecology Across Scales (NSF Research Training Program).

Supraja Rajagopal, Ph.D. Ecology, expected graduation spring 2025: Topic: Collective behavior and consequences for infection in a social insect.

Brendan Haile, Ph.D. Ecology/IDEAS, expected graduation spring 2025. Topic: Coinfection and habitat quality as cross-scale drivers of infection dynamics.

Zachary Arnold, M.S. Ecology/CESD, *graduated spring 2021*. Thesis Title: Exploring the impacts of landfills on bird communities: an opportunity for grassland bird conservation. Zach is currently a high school Biology teacher at Mount Vernon College.

Isabella Ragonese, Ph.D. Ecology/IDEAS, expected graduation spring 2024. Topic: Cross-scale effects of climate warming in a migratory insect host-pathogen system (co-advised).

Megan Tomamichel, Ph.D. Ecology/IDEAS, expected graduation spring 2024. Topic: Global change and aquatic host-parasite dynamics: application to an emerging parasite in a Georgia fishery (co-advised).

Cali Wilson, Ph.D. Ecology/IDEAS, expected graduation spring 2024. Topic: Effects of urbanization and food subsidy on behavior and pathogen transmission in an urban-dwelling waterbird (co-advised)

Claire Teitelbaum, Ph.D. Ecology, *graduated spring 2021*. Dissertation Title: Nomadic animal movement and infectious disease in changing landscapes (co-advised). Dr. Teitelbaum is currently a post-doctoral quantitative ecologist at the USGS Eastern Ecological Science Center.

**iv. Graduate Student Advisory Committee membership (n=23, in reverse chronological order).** All UGA Ecology unless noted otherwise.

**Current:** Carlos Molinero, Doreen Chaussadas, Anecia Gentles, Nikki Solano, Julie Blaze, Maria Luisa Muller Theissen, Allison Williams

**Graduated:** Heather Gaya (UGA Forestry and Natural Resources), Benjamin Taylor, Caroline Aikins, Katherine Christie (UGA Forestry and Natural Resources), Cody Prouty, Meredith Kernbach (U. South Florida, Global Communicable Disease), Kerri Miazgowicz (UGA Infectious Diseases), John Vinson, Cecilia Sánchez, Ania Majewska, Anjelika Kidd (UGA Forestry and Natural Resources), Daniel Becker, Sandra Hoffberg (UGA Genetics), Dara Satterfield, Fan Liu (UGA Environment and Design), Julie Rushmore

**v. Supervision of Undergraduate Research** (n=19; in reverse chronological order). Asterisks indicate co-authored publication.

*NSF REU site Population Biology of Infectious Disease program:* Program recruits trainees from underrepresented groups and non-research institutions.

Annalise Kramer, Maya Sarkar\*, Chastity Ward, Katelyn Adkins, Celine Snedden\*, Anna Schneider\*, Mary-Kate Williams\*

*UGA:* Ify Nwosu, Phillip Salzinger, Tenacity Murdie, Julia Weil, Natalie Bachner\*, John Mark Simmons, Emma Bay Dickinson, Zachary Arnold\*, Nathaniel Haulk, Brandon Coogler, Javiera Alarcon-Valenzuela, Vivi Nguyen

**vi. Academic Advising, Internship and Other Mentorship** (n=7)

Lewis Bartlett (postdoc professional development mentor); Julia Weil (Women in Science faculty mentor); Josiah Lavendar, Audrey Miller, Ryan Chitwood, Heather Abernathy (professional development mentor); Katie Gwaltney, Brandon Coogler, Crane Breithaupt (Ecology internship advisor)

**vii. Selected Student Mentee Achievements**

External = national/international recognition, UGA = University-wide award, IDEAS = NSF graduate training program award, Ecology = Odum School of Ecology

Student	Source	Award (duration if > 1 year; date awarded)
Isabella Ragonese	External	NSF Graduate Research Fellowship (3 years; 2019)
	UGA	UGA Sustainability Grant (2020)
	IDEAS	Research Assistantship (2 years; 2018); Small Research Grant (2019, 2021)
Claire Teitelbaum	External	NSF Graduate Research Fellowship (3 years; 2017) NSF Graduate Research Internship (2019) Best poster, North American Congress for Conservation Biology (2020) Session presider: Gordon Research Seminar, Lucca, Italy (2019) Invited speaker: Gordon Research Conference, Lucca, Italy (2023)
	UGA	Presidential Fellowship (2 years; 2016); Graduate Education Advancement Board Fellowship (2019); James L. Carmon Honorarium (2020); Stoddard-Burleigh-Sutton Award for Wildlife Conservation (2021)
	Ecology	1 <sup>st</sup> place oral presentation, Graduate Student Symposium (2018, 2020, 2021); Best student paper award (2019)
Megan Tomamichel	External	NOAA Georgia Sea Grant Research Traineeship (2021)
	UGA	Innovative and Interdisciplinary Research Grant (2019); SEC Emerging Scholar Award (2023)
	IDEAS	Research Assistantship (2 years; 2018); Small Research Grant (2019, 2021)
	Ecology	Small Research Grant (2019)

Cali Wilson	External	Oconee Rivers Audubon Society Conservation Grant (2019); scholarship to attend Clinic on Dynamical Approaches to Infectious Disease Data (2020)
	UGA	Graduate Education Advancement Board Fellowship (2019); Innovative and Interdisciplinary Research Grant (2019)
	IDEAS	Research Assistantship (2 years; 2018); Small Research Grant (2019)
	Ecology	2 <sup>nd</sup> place oral presentation, Graduate Student Symposium (2019)
Tenacity Murdie	UGA	Center for Undergraduate Research Opportunities (CURO) fellowship (2023), UGA Foundation fellowship (2023), UGA Presidential Scholar
Emma Dickinson	External	Blue Key National Honor Society
	UGA	UGA Libraries Undergraduate Research Award (2020)
	Ecology	Richardson-Golley Award for Excellence in Undergraduate Studies (2020)
Julia Weil	External	NSF Graduate Research Fellowship
	UGA	CURO fellowship (2021)

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## ACADEMIC SERVICE

### I. Service to the Profession

#### *i. Awards and Recognition*

Outstanding Reviewer Status (for number of reviews completed), Journal of Theoretical Biology (2015).

#### *ii. Service to Professional Societies*

Member of the Ecological Society of America (Theoretical Ecology and Disease Ecology Sections), and the Society for Mathematical Biology. Service includes judging student talks and posters, and volunteering as a faculty mentor for early career scientists at annual meetings.

#### *iii. Service to Scientific Journals*

Associate Editor: Journal of Animal Ecology

Ad hoc Handling Editor: Ecology, Philosophical Transactions of the Royal Society B.

Manuscript Reviewer (n=28 journals): The American Naturalist, Animal Migration, Biological Invasions, Biological Reviews, Ecology, Ecology and Evolution, Ecology Letters, Emerging Microbes and Infections, Integrative and Comparative Biology, Journal of Animal Ecology, Journal of Applied Ecology, Journal of Mathematical Biology, Journal of the Royal Society Interface, Journal of Theoretical Biology, Journal of Zoology, Mathematical Biosciences, Movement Ecology, Nature Scientific Reports, Oecologia, Oikos, Philosophical Transactions of the Royal Society B, PLoS One, Population Ecology, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B, Royal Society Open Science, Theoretical Ecology, Trends in Ecology and Evolution.

#### *iv. Grant Reviewing*

Review panel member: NSF Macrosystems Biology (2019), Population and Community Ecology (2015).

Grant reviewer: Swiss National Science Foundation (2023), NSF Macrosystems Biology (2020), The Wellcome Trust Sir Henry Dale Fellowship (2019), UK Natural Environment Research Council (2017).

#### *v. Other Professional Service*

Ph.D. external examiner for Nicholas Cunniffe, Dept. Plant Sciences, Cambridge University (2008).

## **II. Service to the University**

### ***i. University-wide Committee Service*** (n=7)

President's Faculty Advisory Committee (2021-2023)

UGA Campus Pollinator Committee (2020-present)

James L. Carmon Research Award for graduate student innovation in computational research, review committee member (2020-21) and chair (2022)

Infectious Disease Ecology Across Scales Ph.D. Steering Committee (2015-present)

Integrative Conservation Ph.D. Graduate Affairs Committee (2014-2017)

Warnell School of Forestry Stoddard-Burleigh-Sutton Graduate Award for excellence in graduate research in Ornithology and Conservation, review committee member (2015-present)

Co-founding member, Computational Ecology and Epidemiology Study Group (now the Center for the Ecology of Infectious Diseases) (2009-2015)

### ***ii. Departmental Service***

Ecology Seminar Committee Chair (2020-present)

Staff Search Committee Chair: Communications Director (2022)

Faculty Search Committee member (5): Open Rank Quantitative Disease Ecology (2022), Assistant Professor in Infectious Disease Ecology (2020, 2022), Lecturer in Ecology (2015, 2018)

Infectious Diseases Undergraduate Affairs Committee (2015-present)

Ecology Undergraduate Affairs Committee (2013-2019)

Ecology Steering Committee (2017-2018)

Ecology 50<sup>th</sup> anniversary celebration planning committee (2017-2018)

Ecology AB Planning and Curriculum Committee (2014-15)

Ecology Strategic Planning Committee (2013-2014)

### ***iii. Service to Student Groups and Organizations***

Faculty advisor, Lilly Branch Audubon Society (UGA Chapter of National Audubon, 2019-present)

Faculty advisor, Society for Conservation Biology, UGA Chapter (2013-2017)

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## **PUBLIC SERVICE AND OUTREACH**

### ***i. Awards and Achievements***

2020 Binoculars for Young Black Birders Fundraising Committee Member (helped coordinate fundraiser that raised ~\$18,000 to buy binoculars and field guides for Black K-12 students in Athens-Clarke Co.)

2018 Recipient of Oconee Rivers Audubon Society CASE Award for outstanding service to environmental issues in north Georgia and dedicated service to the Audubon Society

2014 O'Grady Bird Habitat Restoration Project. Organized fundraiser that raised > \$5,000 to support restoration of native rivercane and wildlife-friendly habitat in the State Botanical Garden of GA.

## **ii. Leadership in Conservation and Community Science**

*Oconee Rivers Audubon Society* President (elected, 2011-2015) and Board member (2015-present). Duties include coordinating public outreach events, fundraising, interviews with local media, reviewing small grants, chairing monthly speaker meetings, leading field trips, and habitat restoration.

*Georgia Ornithological Society* Checklists and Records Committee (elected, 2013-present). Duties include maintaining the official list of birds recorded in the state of Georgia, evaluating records of rare and colonizing species, and increasing knowledge of bird abundance and distribution in the state.

*Local conservation advising*: Partnered with university, county and NGO stakeholders in local habitat restoration projects, including invasive plant removal workdays and creating native pollinator habitat.

*Community Science*: Regional reviewer for eBird (Cornell Lab of Ornithology), verifying bird sightings submitted by the public to a global database of bird observations. Participant in community science programs including the Christmas Bird Count, Breeding Bird Survey and Great Backyard Bird Count.

## **iii. Public engagement and K-12 education**

*Public talks*: 3-5 talks per year given to natural history societies and public audiences, including: Sierra Club of Charleston, Coastal Wildscapes, Little St Simons Island spring and fall birding festival, Osher Lifelong Learning Institute, Birds Georgia, Reynolds Lake Oconee, Southern Wings Birding Clubs, 4 Georgia Chapters of National Audubon (Oconee, Ogeechee, Coastal Georgia, Ocmulgee).

*Youth outreach events*: Georgia DNR Youth Birding Competition, bird walk leader, North Oconee High School Birding Club, activities and tabling at Athens Vulture Festival, Georgia Questival

*K-12 talks and lessons*: classes prepared for Environmental Sciences Summer Camp Academy, State Botanical Garden of Georgia; Mount Vernon School, Notre Dame Academy Duluth, Oglethorpe Elementary School