

# Tara E. Stewart Merrill

Cary Institute of Ecosystem Studies

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## EDUCATION

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Ph.D. in Ecology, Evolution & Conservation, Aug 2019, *University of Illinois at Urbana-Champaign*

B.A. in Biology, June 2011, *University of California, Santa Barbara*

B.F.A. in Dance, June 2008, *University of California, Santa Barbara*

## PROFESSIONAL APPOINTMENTS

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**Assistant Scientist** (September 2024 – present)

*Cary Institute of Ecosystem Studies*

**Assistant Research Professor** (January 2022 – August 2024)

*Florida State University Coastal and Marine Laboratory*

**Life Sciences Research Foundation Postdoctoral Fellow** (August 2019 – December 2021)

*University of Colorado Boulder*

**Lecturer**, Ecology and Evolutionary Biology, University of Colorado Boulder (Jan 2020-May 2020)

Course: Parasitology

**National Science Foundation Graduate Research Fellow** (August 2014 – July 2019)

*University of Illinois at Urbana-Champaign*

**Laboratory Assistant** (January 2014 – August 2014)

*University of Illinois at Urbana-Champaign*

**Laboratory Assistant** (June 2011 – August 2013)

*University of California Santa Barbara*

## PEER-REVIEWED PUBLICATIONS

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\*denotes student author

(25) Johnson, P.T.J., **T.E. Stewart Merrill**, A.D. Dean & A. Fenton. 2024. Diverging effects of host density and richness across biological scales drive diversity-disease outcomes. *Nature Communications* 15:1937.

(24) Terrill Sondag\*, E.E., **T.E. Stewart Merrill**, J. Drnevich, J.R. Holmes, E.K. Fischer, C.E. Cáceres & L.R. Strickland. 2023. Differential gene expression in response to fungal

- pathogen exposure in the aquatic invertebrate, *Daphnia dentifera*. ***Ecology and Evolution*** 13:e10354.
- (23) Johnson, P.T.J., **T.E. Stewart Merrill**, D.M. Calhoun, T. McDevitt-Galles & B. Hobart. 2023. Into the danger zone: how the within-host distribution of parasites controls virulence. ***Ecology Letters***. doi: 10.1111/ele.14352.
- (22) Pine, W.E., J. Brucker, M. Davis, S. Geiger, R. Gandy, A. Shantz, **T. Stewart Merrill** & E.V. Camp. 2023. Collapsed oyster populations in large Florida estuaries appear resistant to restoration using traditional clutching methods—insights from ongoing efforts in multiple systems. ***Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science*** 15:e10249.
- (21) Westphal, G.H.\* & **T.E. Stewart Merrill**. 2022. Partitioning variance in immune traits in a zooplankton host - fungal parasite system. ***Ecology and Evolution*** 12:e9640.
- (20) Cáceres, C.E. & **T.E. Stewart Merrill**. 2022. The role of varying resources on *Daphnia dentifera* immune responses. ***Fundamental and Applied Limnology*** 196:217-228.
- (19) Hopkins, S.R., K.D. Lafferty, C.L. Wood, S.H. Olson, J.C. Buck, G.A. De Leo, K.J. Fiorella, J.L. Fornberg, A. Garchitorena, I.J. Jones, A.M. Kuris, L.H. Kwong, C. LeBoa, A.E. Leon, A.J. Lund, A.J. MacDonald, D.C.G. Metz, N. Nova, A.J. Peel, J.V. Remais, **T.E. Stewart Merrill**, M. Wilson, M.H. Bonds, A.P. Dobson, D. Lopez Carr, M.E. Howard, L. Mandle & S.H. Sokolow. 2022. Evidence gaps and diversity among potential win-win solutions for conservation and human infectious disease control. ***Lancet Planetary Health*** 6:e694-e706.
- (18) **Stewart Merrill, T.E.**, C.E. Cáceres, S. Gray\*, V.R. Laird\*, Z.T. Schnitzler\* & J.C. Buck. 2022. Timescale reverse the relationship between host density and infection risk. ***Proceedings of the Royal Society B: Biological Sciences*** 289:20221106.
- (17) **Stewart Merrill, T.E.**, D. Calhoun & P.T.J. Johnson. 2022. Beyond single host, single parasite interactions: quantifying competence for complete multi-host, multi-parasite communities. ***Functional Ecology*** 36:1845-1857.
- (16) Hobart, B., W. Moss, T. McDevitt-Galles, **T.E. Stewart Merrill** & P.T.J. Johnson. 2022. It's a worm-eat-worm world: consumption of parasite free-living stages protects hosts and benefits predators. ***Journal of Animal Ecology*** 91:35-45.
- (15) Rogalski, M., **T.E. Stewart Merrill**, C. Gowler, C.E. Cáceres & M.A. Duffy. 2021. Context dependent host-symbiont interactions: shifts along the parasitism-mutualism continuum. ***American Naturalist*** 198:563-575.
- (14) **Stewart Merrill, T.E.**, Z. Rapti & C.E. Cáceres. 2021. Host controls of within-host disease dynamics: insight from an invertebrate system. ***American Naturalist*** 198:317-322.

- (13) **Stewart Merrill, T.E.**, S.R. Hall & C.E. Cáceres. 2021. Parasite exposure and host susceptibility jointly drive the emergence of epidemics. *Ecology* 102:e03245.  
*Winner of the ESA Disease Ecology section's Best Student Paper award*
- (12) **Stewart Merrill, T.E.** & P.T.J. Johnson. 2020. Towards a mechanistic understanding of competence: a missing link in diversity-disease research. *Parasitology* 147:1159-1170.
- (11) Rapti, Z., **T.E. Stewart Merrill**, B. Mueller-Brennan, J.H. Kavouras & C.E. Cáceres. 2019. Indirect effects in a planktonic disease system. *Theoretical Population Biol* 130:132-142.
- (10) **Stewart Merrill, T.E.**, S.R. Hall, L. Merrill & C.E. Cáceres. 2019. Variation in immune defense shapes disease outcomes in laboratory and wild *Daphnia*. *Integrative & Comparative Biology* 59:1203-1219.
- (9) Merrill, L., **T.E. Stewart Merrill**, A. Barger & T.J. Benson. 2019. Avian health across the landscape: nestling immunity covaries with changing landcover. *Integrative & Comparative Biology* 59:1150-1164.
- (8) **Stewart Merrill, T.E.** & C.E. Cáceres. 2018. Within-host complexity of a plankton-parasite interaction. *Ecology* 99:2864-2867.
- (7) Rosencranz, J.A., K.D. Lafferty, K.M. Thorne, K.J. Buffington, J. Takekawa, R.F. Hechinger, **T.E. Stewart**, R.F. Ambrose, G.M. MacDonald, M. Holmgren, J. Crooks & R. Patton. 2018. Sea-level rise, habitat loss, and potential extirpation of a salt marsh specialist bird in urbanized landscapes. *Ecology and Evolution* 8:8115-8125.
- (6) **Stewart, T.E.**, M.I. Torchin & C.E. Cáceres. 2018. Invisible parasites and their implications for coexisting water fleas. *Journal of Parasitology* 104:101-105.
- (5) Merrill, L., M. Naylor, M. Dalimonte, S. McLaughlin, **T. Stewart** & J. Grindstaff. 2017. Early life immune activation increases song complexity and alters phenotypic associations between sexual ornaments. *Functional Ecology* 31:2263-2273.
- (4) Buck, J.C., R.F. Hechinger, A.C. Wood, **T.E. Stewart**, A.M. Kuris & K.D. Lafferty. 2017. Host density increases parasite recruitment but decreases host risk in a snail-trematode system. *Ecology* 98:2029-2038.
- (3) **Stewart, T.E.** and S.A. Schnitzer. 2017. Blurred lines between competition and parasitism. *Biotropica* 49:433-438.
- (2) **Stewart, T.E.** and L. Merrill. 2015. Host sex and parasitism in Red-winged Blackbirds (*Agelaius phoeniceus*): examining potential causes of infection biases in a sexually dimorphic species. *Canadian Journal of Zoology* 93:21-29.
- (1) Merrill, L., **T.E. Stewart**, P.L. Gonzalez-Gomez, A.L. O'Loughlen, J.C. Wingfield, V.A. Ellis and S.I. Rothstein. 2014. Epaulet size and current condition in Red-winged Blackbirds: examining a semi-static signal, testosterone, immune function, and parasites. *Physiological and Biochemical Zoology* 88:11-21.

## PUBLICATIONS IN REVIEW OR IN REVISION

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- (26) Wilson, P., C.E. Cáceres & **T.E. Stewart Merrill**. Exposure to fungal infection reduces eye size in the zooplankton, *Daphnia*. Submitted: Journal of Plankton Research
- (27) Rivera-Quiñones, V., **T.E. Stewart Merrill**, C.E. Cáceres & Z. Rapti. Modeling transmission at the ecological-immunological interface: an invertebrate disease model with consecutive immune defenses and resource dependence. In revision.  
\*Co-first author
- (28) Woodhams, D.C., N.B. McDonnell, M. Roberson, J.D. Jabon, O.O. Adigun, B.H. Silva, R. Correia, C.L. Shay & **T.E. Stewart Merrill**. Behavioral exposome shapes amphibian disease susceptibility. In revision.

## BOOK CHAPTERS

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**Stewart Merrill, T.E.**, A.A. Aguirre, B.F. Allan & C.A. Whittier. 2024. Ecosystems and infectious disease. In Will E. Sander (Ed.), *Global One Health and Infectious Diseases: An Interdisciplinary Practitioner's Guide*. CRC Press.

## GRANTS, FELLOWSHIPS, AND AWARDS

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- 2021 Ecological Society of America Disease Ecology Section: Best Student Paper award
- 2019 Life Sciences Research Foundation (sponsored by the Simons Foundation) **\$156,000** salary plus **\$30,000** research funds distributed over three years  
Schmidt Science Fellows finalist (*final interview declined in lieu of LSRF*)
- 2017 NSF Doctoral Dissertation Improvement Grant **\$20,539**  
Lebus Fund Award, University of Illinois **\$990**  
Summer Research Grant, University of Illinois **\$1000**
- 2016 Dresden Student Travel Award, American Society of Parasitologists **\$600**  
Clark Research Award, University of Illinois **\$1000**
- 2016 NSF IGERT research grant, University of Illinois **\$5,000**
- 2015 Summer Research Grant, University of Illinois **\$1000**
- 2014 NSF Graduate Research Fellowship (fellowship and tuition) **\$138,000**  
NSF IGERT Fellowship, **\$64,000**

## INVITED PRESENTATIONS

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- 2024 **ESA Organized Oral Symposium**, "The role of individual variation and species-level differences in a trait-based ecology of infectious diseases", Long Beach, CA: Talk

- Ecology and Evolution of Infectious Disease**, Stanford, CA: Talk
- University of Georgia**, Odum School of Ecology, GA: Seminar
- Cornell University**, Department of Computational Biology, NY: Chalk Talk
- Cornell University**, Department of Computational Biology, NY: Seminar
- 2023 **Cary Institute of Ecosystem Studies**, NY: Seminar
- UC Santa Barbara**, Ecology, Evolution, and Marine Biology, CA: Seminar
- Florida State University**, Coastal and Marine Lab Public Lecture Series, FL: Seminar
- 2022 **Emory University**, Infectious Disease Across Scales Series, Emory, GA: Seminar
- CSU Monterey Bay**, Department of Natural Resources, Monterey, CA: Seminar
- 2021 **British Ecological Society**, Liverpool, UK: Ecology Across Borders special session
- Denver University**, Department of Biological Sciences, Denver, CO: Seminar
- UMass Lowell**, Biology Department, Lowell, MA: Seminar
- Florida State University**, Coastal and Marine Laboratory, Tallahassee, FL: Chalk talk
- Florida State University**, Coastal and Marine Laboratory, Tallahassee, FL: Seminar
- University of Delaware**, Entomology and Wildlife Ecology, Newark, DE: Seminar
- University of Massachusetts Boston**, Biology Department, Boston, MA: Seminar
- Leibniz Institute of Freshwater Ecology**, Berlin: Seminar and Discussion
- 2020 **Cornell University**, Ecology and Evolutionary Biology, Ithaca, NY: Chalk talk
- Cornell University**, Ecology and Evolutionary Biology, Ithaca, NY: Seminar
- University of Michigan**, Ecology and Evolutionary Biology, Ann Arbor, MI: Seminar
- 2019 **Society for Integrative and Comparative Biology Symposium**, Tampa, FL: Symposium
- 2018 **University of Illinois Mathematical Biology**, Urbana, IL: Seminar
- 2017 **Biomathematics & Ecology: Education and Research**, Bloomington, IL: Symposium

## CONTRIBUTED PRESENTATIONS

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- 2023 Toward resolution in diversity-disease theory: an empirical investigation of disease metrics and a whole-ecosystem manipulation. Ecological Society of America, Portland, OR (talk)
- 2021 Disentangling mechanisms in biodiversity-disease research: integrating transmission models, statistical analogs, lab experiments, and field manipulations. Life Sciences Research Foundation Annual Meeting (virtual poster)
- 2020 Toward a mechanistic understanding of competence: investigating a missing link in diversity-disease theory. Ecological Society of America, Salt Lake City, UT (virtual talk during COVID-19)

- 2019 Host competence: a missing link in biodiversity-disease research. Life Sciences Research Foundation Annual Meeting, Baltimore, MD (poster)
- 2018 Variable immunity and its consequences for parasite dynamics. UIUC Program in Ecology, Evolution & Conservation Biology seminar (talk)
- Exposure and susceptibility jointly drive epidemic emergence. Ecological Society of America, New Orleans, LA (talk)
- Exposure and susceptibility jointly drive epidemic emergence. UIUC Graduate Student Symposium, Urbana, IL (talk)
- 2017 Plankton-parasite interactions: a window into the within-host dynamics. Ecology and Evolution of Infectious Disease, Santa Barbara, CA (talk)
- Plankton-parasite interactions: a window into the within-host dynamics. Association for the Sciences of Limnology and Oceanography, Honolulu, HI (talk)
- 2016 A closer look reveals a role for parasites in *Ceriodaphnia* competition. Association for the Sciences of Limnology & Oceanography, Santa Fe, NM (talk)
- Plankton-parasitoid interactions: a window into the within-host dynamics. American Society of Parasitologists, Edmonton, Alberta (talk)
- Diving into *Daphnia* defenses: how a waterflea kills its parasitic invaders. UIUC Graduate Student Symposium, Urbana, IL (talk)
- 2015 What's parasitizing tropical zooplankton? A survey of Cladocerans and their parasites from the bays of Barro Colorado Island. Ecological Society of America, Baltimore, MD (poster)
- 2014 Disease resistance is influenced by intestinal morphology in *Daphnia dentifera*. Ecological Society of America, Sacramento, CA (poster)
- 2013 Where are the birds in Carpinteria Salt Marsh? Mapping the estuary's avifauna in space and time. UCSB Natural Reserve Symposium, Santa Barbara, CA (talk)
- Where are the birds in Carpinteria Salt Marsh? Mapping the estuary's avifauna in space and time. UCSB Graduate Student Symposium, Santa Barbara, CA (poster)
- 2010 Sex-biased variation in parasitism of breeding Red-winged Blackbirds. UCSB College of Creative Studies Science Week, Santa Barbara, CA (poster)

## TEACHING EXPERIENCE AND TRAINING

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- 2022 **Invited guest lecturer:** Biology of Infectious Disease, UNC Wilmington
- Invited guest lecturer:** Disease Ecology, Purdue University
- 2021 **Invited guest lecturer:** Population Biology, UMass Boston
- Invited guest lecturer:** Disease Ecology, Purdue University
- 2020 **Lecturer appointment:** Parasitology, University of Colorado Boulder
- 2018 **Fellow:** Mobile Summer Institute on Scientific Teaching, University of Illinois

- Invited guest lecturer:** Marine Biology, University of Illinois
- 2016 **Instructor:** Epidemiology/Parasitology, University of Illinois  
**Teaching Assistant:** Vertebrate Natural History, University of Illinois  
**Invited guest lecturer:** Summer Illinois Mathematics Camp, University of Illinois  
**Invited guest lecturer:** Ornithology, University of Illinois
- 2014 **Teaching Assistant:** Environmental Biology, University of Illinois
- 2009 **Instructor:** Physically Integrated Dance, Keshet Dance Company, Albuquerque, NM  
**Instructor:** Dance, Title One Homeless Project, Albuquerque, NM  
**Instructor:** Dance, Math, Language, and Conflict Resolution, Youth Diagnostic and Development Center, Albuquerque, NM
- 2008 **Instructor:** Dance, Title One Homeless Project, Albuquerque, NM  
**Instructor:** Dance, Math, Language, and Conflict Resolution, Youth Diagnostic and Development Center, Albuquerque, NM

## OUTREACH AND STUDENT-CENTERED ACTIVITIES

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**1) Diversity and Inclusion:** Participant in the CU Boulder Ecology and Evolutionary Biology “Diversity and Inclusion Seminar” which met weekly to provide training and advance departmental diversity and inclusion efforts (2019-2021). Member of the FSU Biology Diversity, Equity, and Inclusion Steering Committee (2023-present) and co-leader of the Department Dialog (November 2023)

**2) Undergraduate Research Mentor:** Received training in mentoring via several university sponsored workshops (UIUC, CU Boulder, and FSU) and closely mentored 30 undergraduate students in science. Students receive interdisciplinary training in aquatic ecology, parasitology, and statistics, and contribute to laboratory projects, develop independent research, and complete honors theses. (2010-present)

**3) High School Mentor:** Virtually mentored ten students from high schools across the state of Illinois working to complete group and independent projects (2015-18). Hosted three high school students in the lab for a six-week immersive research experience through the FSU Young Scholars Program (2023). Virtual mentor for a high schooler in the Center for Advanced Studies and Research through Thousand Oaks High School (2023)

**4) Mobile Summer Institute Fellow:** Participated in a week-long training intensive, the *Summer Institute on Scientific Teaching*, which covered evidence-based teaching strategies, student diversity, and how to maintain equity in the classroom. As part of the intensive, I co-developed a 30-minute hands-on learning activity that will be made available for educators on the institute’s website (<https://www.summerinstitutes.org/teachable-tidbits>) (2018)

**5) Girls Explore Biology Instructor:** Volunteer instructor for the *Girls Explore Biology* summer camp for kindergarten to fourth grade girls in Champaign-Urbana, IL. I co-designed and

implemented three hour-long teachable units in avian biology, including species identification, feeding strategies and morphology, and birdsong (2014; 2015; 2018)

**6) Mathematics Camp Instructor:** Volunteer instructor at the *Summer Illinois Mathematics Camp*, a free camp for middle to high school students exploring math and biology (2016).

## MENTORING, ADVISING, AND COMMITTEES

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Underline denotes honors thesis, \*denotes co-author on publication (including in prep)

### PhD students (1)

Grace Westphal (2024-present)

### Master's students (2)

Alaina Young (2023-present); Grace Westphal\* (2022-2024)

### Doctoral committees (4)

Elizabeth Haywood (FSU Mathematics, 2022-present), Miles Robertson (FSU Biology, 2022-present), Grace Westphal (2022-present), Patrick Wilson (UIUC Ecology, 2021-present)

### Undergraduates (30)

Sarah-Kate Srivastava (FSU 2023-present), Aiden Hutt (FSU 2023-present), Isabella Coddington (FSU 2023-present), Jake Lighthall (FSU 2023-present), Ty McCaffrey (CU Boulder, 2021-present)\*, Christina Snow (CU Boulder, 2021)\*, Grace Westphal (UIUC, 2021-2022)\*, Madelyn McLaughlin (CU Boulder, 2019-2021)\*, Emily Terrill (UIUC, 2021-2021)\*, Delvecchio Wilson (CU Boulder 2020-2021), Fox Freeman (CU Boulder, 2020-2021), Jackson McKinney (CU Boulder, 2020), Margaret Paige Paulson (CU Boulder, 2019-2020), Sarah Von Hoene (CU Boulder, 2019), Cecily Negri (UIUC 2018-2019), Samantha Gray (UIUC, 2018-2019)\*, Veronika Laird (UIUC, 2018-2019)\*, Diana Oleksyn (UIUC, 2018-2019), Anna Osborn (UIUC, 2018-2019), Zoe Schnitzler (UIUC, 2018-2019)\*, Krti Tallam (UIUC, 2016-2018), Gargi Sundaram (UIUC, 2015-2017), Kaileen Dinnon (UIUC, 2015-2016), Peter Schmucker (UIUC, 2015-2016), Samantha Kopec (UIUC, 2014-2016), Mariah Matthews (UIUC, 2014), Jelena Verkler (UIUC, 2014), Jessica Abron (UCSB, 2012), Anuskhika Ganegoda (UCSB, 2010), Erin O'Leary (UCSB, 2010)

### High School Students (14)

Ava Kramer, Nathaniel Levy, Miaohan Lin, Stella Xu, plus ten additional students (names confidential) through the Illinois STEM Mentor Matching Machine

## PROFESSIONAL SERVICE AND ACTIVITIES

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### Special Issues

- Organizing editor of *Oecologia* special issue, *Parasite Ecology in Aquatic Ecosystems*

### Professional Positions

- Chair for the ESA Disease Ecology section (Sep 2023-Aug 2024)
- Vice-Chair for the ESA Disease Ecology section (Jan 2023-Aug 2023)
- Handling Editor for *Oecologia* (Jan 2024-present)



### **National and International Conferences**

- Session co-organizer: Uniting predator-prey and parasite-host theory under a general consumer-resource framework. Ecological Society of America, New Orleans, LA, 2018.
- Session co-organizer: The role of individual variation and species-level differences in a trait-based ecology of infectious disease. Ecological Society of America, Long Beach, CA, 2024.

### **Society Affiliations**

- American Ornithological Society
- American Society of Parasitologists
- Association for the Sciences of Limnology and Oceanography
- Ecological Society of America
- Society for Integrative and Comparative Biology

### **Journal Reviews**

- American Naturalist
- Ecology
- Ecology and Evolution
- Ecology Letters
- Evolutionary Ecology
- Freshwater Biology
- Hydrobiologia
- International Journal for Parasitology
- Journal of Animal Ecology
- Journal of Applied Ecology
- Marine Ecology Progress Series
- Nature Scientific Reports
- Parasitology
- Parasitology Research
- PLOS Computational Biology
- Proceedings of the Royal Society B: Biological Sciences
- Trends in Ecology & Evolution

### **Institutional and Departmental Service**

- Diversity, Equity, and Inclusion Steering Committee (FSU 2023-2023)
- Organizer for NSF GRFP workshop for graduate applicants (FSU 2023)
- Presenter for Women in Science, Math, and Engineering (FSU 2022)
- Graduate fellowship application reviewer (FSU 2022)
- Graduate Admissions Committee (UIUC 2018)
- Organizer for the Graduate Student Symposium (UIUC 2017)
- Events Coordinator for the Graduates in Ecology and Evolutionary Biology (UIUC 2015)
- Graduate Panelist at the Illini Wildlife and Conservation Club (UIUC 2016)