

Derek R. McFarland, Jr.

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Education

Ph.D. Candidate in Ecology, Evolution, and Conservation Biology, University of Illinois Urbana-Champaign, Urbana, IL, *start: May 15, 2020*, *expected year of degree conferral **2026***

B.Sc. in Biology, *summa cum laude*, Honors College, Harris-Stowe State University, St. Louis, MO, *start: August 21, 2017* **2020**

Publications | [ORCID: 0000-0001-6143-7669](#) | [Google Scholar](#)

- **McFarland Jr, Derek***; Allan, Brian. Time-varying microclimate effects on lone star tick (*Amblyomma americanum*) survival in urban and bush honeysuckle (*Lonicera maackii*)-invaded forests. *In Preparation for *Journal of Medical Entomology*
- **McFarland Jr, Derek***; Rajagopalan, Shreyas; Zhang, Junhe; Allan, Brian. High variance in prevalence estimates of Bourbon and Heartland viruses in field-collected *Amblyomma americanum* ticks depending on sample size: A brief review. *In Preparation for *Emerging Infectious Diseases*
- **McFarland Jr, D.**, Wallace, K., Blocher, B. H., Nicholson, W. L., Soares, L., & Adalsteinsson, S. A. (2025). High burdens of *Ixodes scapularis* ticks and surveillance for *Babesia* spp. in Carolina Wrens (*Thryothorus ludovicianus*) in Missouri, USA. *Journal of Medical Entomology*, tjaf076.
- **McFarland Jr, D.**, Fredericks, L. P., Hedlund, T., Jones, S., Keesing, F., Mutinda, M., & Allan, B. F. (2024). A suite of pathogens detected in ticks sampled from wildlife hosts in central Kenya. *African Journal of Ecology*, 62(3).
- Aziati, I. D., **McFarland Jr, D.**, Antia, A., Joshi, A., Aviles-Gamboa, A., Lee, P., Adalsteinsson, S.A. & Boon, A.C. (2022). Prevalence of Bourbon and Heartland viruses in field collected ticks at an environmental field station in St. Louis County, Missouri, USA. *Ticks and Tick-borne Diseases*, 102080.

Research Experience

PROJECT #1: Effects of Human-Mediated Landscape Change on Tick-Borne Disease Risk in St. Louis, MO

Mentor/Ph.D. Advisor: Brian Allan, Ph.D.

2020–present

Ph.D. Student, Program in Ecology, Evolution, and Conservation Biology, University of Illinois UC

- Sampled and taxonomically identified ticks from 31 sites across the St. Louis, MO metropolitan area using carbon-dioxide trapping protocol and estimated wildlife host activity using dung surveys
- Conducted pathogen analyses and sequencing using DNA-based RT-PCR methods for detecting bacterial pathogens (*Ehrlichia* spp.) in 1,492 lone star tick samples
- Employed methods in ArcGIS to map and quantify landscape metrics (i.e., composition, functional connectivity, change over time, tick-borne disease risk, etc.) throughout the study region
- Investigated effects of plant invasion and urbanization on tick survival using experimental field assays and analyzed effects using Cox proportional hazards regression among other methods
- Supervised, trained, and organized 7 undergraduate research assistants in field and lab protocols

PROJECT #2: Prevalence of Bourbon Virus in Field-Collected Ticks in Saint Louis County, Missouri

Mentors: Adrianus Boon, Ph.D. & Solny Adalsteinsson, Ph.D.

2019–2020

STEP-UP Research Fellow, National Institutes of Health – NIDDK

Research Intern, Division of Infectious Diseases, Washington University School of Medicine

- Analyzed samples for presence of virus using quantitative RT-PCR and plaque assays
- Performed RNA extraction, cDNA synthesis, gel electrophoresis, and quantitative RT-PCR

Tyson Fellow, Tyson Research Center, Washington University in St. Louis

- Optimized lab protocol for extraction and detection of novel, tickborne RNA viruses from ticks
- Sampled and taxonomically identified ticks using drag sampling

PROJECT #3: Absence of *Babesia* spp. Parasites in a Population of Carolina Wrens, despite high tick burdens

Mentors: Leticia Soares, Ph.D. & Solny Adalsteinsson, Ph.D.

2018–2019

Tyson Fellow, Tyson Research Center, Washington University in St. Louis

- Mist-netted, banded, and blood-sampled 75 songbirds
- Prepared, stained, and analyzed blood slides using Giemsa staining and microscopy techniques to determine the prevalence of avian blood parasites
- Sampled and taxonomically identified nymphal and larval ticks from avian hosts

McNair Scholar, McNair Summer Research Program, St. Louis University

- Wrote research proposal and secured funding through the McNair Summer Research Program
- Presented research findings at 13 national and regional conferences, earning 4 awards for effective research presentations and 2 prestigious travel awards

Teaching Experience

* - Rated “Outstanding”, List of Teachers Ranked as Excellent by Their Students, ICES

Teaching Assistant, Advanced GIS in Natural Resources Management (NRES 455)

Department of Natural Resources, University of Illinois

(current) Spring 2026

- Led lab sessions for 58 students, guiding them through complex analyses in ArcGIS Pro software
- Consulted students on GIS-based analytical approaches for final projects and assisted in Esri StoryMap and final report preparation
- Ensured fairness and consistency in grading exams and assignments with personalized feedback

Teaching Assistant, Evolution and Human Health (IB 360)

School of Integrative Biology, University of Illinois

Fall 2025*

- Led discussion sections for 100 students on the evolutionary perspectives of health to inform the treatment of disease and to guide public health policy
- Curated and led lecture on the association of evolutionary life history traits and disease risks

Teaching Assistant, Ecology and Human Health (IB 361)

School of Integrative Biology, University of Illinois

Spring 2024*/2025*

- Delivered guest lecture to 150 students on the impact of the landscape change on infectious diseases, emphasizing the impact of human intervention on environmental and public health outcomes
- Provided support to the instructor and students during lectures, fostering a conducive learning environment, a deep understanding of public health concerns, and data interpretation skills
- Conducted personalized sessions with students to address academic queries and learning deficits
- Maintained fairness and consistency in grading exams and assignments, adhering to deadlines

Teaching Assistant, Introduction to GIS in Natural Resources Management (NRES 454)

Department of Natural Resources, University of Illinois

Fall 2023*/2024*

- Led lab sessions for 100 students, guiding them through complex analyses in ArcGIS Pro software
- Provided individualized assistance to students, troubleshooting issues and enhancing their proficiency in ArcGIS Pro during lab sessions and office hours.
- Ensured fairness and consistency in grading exams and weekly assignments, meeting deadlines with punctuality, precision, and personalized feedback

Teaching Assistant/Tutor, General Physics I | General Physics II | College Algebra

Office of Academic Support, Harris-Stowe State University

2018–2020

- Led group and individual tutoring sessions for 20-30 students

- Assisted teaching by providing supplemental lectures and study materials for students

Leadership and Work Experience

Graduate Mentor & Recruiting Assistant, McNair Postbaccalaureate Achievement Program

Center for Access and Academic Success, University of Illinois

2022–present

- Designed and implemented the UIUC McNair Ambassadors Program, enhancing recruitment efforts by fostering peer-to-peer mentoring relationships and increasing recruitment by 30%
- Provided academic mentoring, monitoring, and advocacy to 20 demographically underrepresented scholars for retention and matriculation to graduate school
- Guided students in developing effective science communication strategies, especially regarding accessible presentations of research findings to non-scientists and diverse audiences

Search Committee Member, Hiring the Assistant Director for the federal TRIO McNair Program

Office for Access and Equity, University of Illinois

2025

- Collaborated with university leadership to equitably identify, interview, and evaluate candidates
- Provided in-depth insight into the needs of underrepresented students, advocating for alignment with the program mission of advancing diversity in undergraduate and graduate education

Student Working Group Member, Fall 2024 Campus Climate Survey

Student Success, Inclusion and Belonging, University of Illinois

2024

- Nominated by faculty to collaborate with a diverse group of undergraduate, professional, and graduate students to facilitate engagement with the fall 2024 Campus Climate Survey
- Developed strategies to encourage student participation and provide feedback and analysis on survey findings and proposed recommendations
- Identified opportunities for student involvement in the campus climate assessment process, including the development of an implementation plan

Graduate Mentor & Program Ambassador, McNair Postbaccalaureate Achievement Program

Office of Pre-College Access & TRIO Programs, St. Louis University

2018–2022

- Assisted recruitment efforts as a McNair Ambassador at Harris-Stowe State University through live speech and video format during outreach events
- Advised 3 undergraduate students in resumé building and graduate school preparation for their successful application and transition to graduate school

Mentorship Experience

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| 2024 | Andrea Gallo Salinas, Allan Lab Undergraduate Researcher, 3 rd year, University of Illinois, Urbana-Champaign |
| 2023 | Matt Beard, Allan Lab Undergraduate Researcher, 2 nd year, School of Integrative Biology Honors, University of Illinois, Urbana-Champaign |
| 2023 | D.J. Thomas, Access and Achievement Program Summer Research Fellowship (AAPSRF) & Allan Lab Undergraduate Researcher, 3 rd year, University of Illinois, Urbana-Champaign |
| 2022 | Shreyas Rajagopalan, Allan Lab Undergraduate Researcher, 4 th year, University of Illinois, Urbana-Champaign; Senior Thesis: Prevalence of Heartland & Bourbon Virus in <i>A. americanum</i> |
| 2022 | Natalie Sinjaradze, Allan Lab Undergraduate Researcher, 1 st year, University of Illinois, Urbana-Champaign |
| 2022 | Ashleigh Cox, AAPSRF Summer Research Fellowship & Allan Lab Undergraduate Researcher, 4 th year, University of Illinois, Urbana-Champaign |
| 2021 | Randy Hartmann, Allan Lab - Undergraduate Research Assistant, 3 rd year, Washington University in St. Louis |

2019 Elora Robeck, Tyson Environmental Research Fellow, 2019, Hazelwood W. High School, MO
 2018 Kayla Wallace, Tyson Environmental Research Fellow 2018, Webster Groves High School, MO
 2018 Julia Berndt, Tyson Environmental Research Fellow 2018, Webster Groves High School, MO

Honors and Awards

2025 Magazine Article Feature, National Wildlife Federation ([link to article](#))
 2025 Urban Biodiversity Futures Workshop, Urban Wildlife Network, Lincoln Park Zoo, Chicago, IL
 2025 Program Enhancement Fund, Entomological Society of America (\$500)
 2025 Rated “Outstanding”, Spring 2025 List of Teachers Ranked as Excellent by Their Students, ICES
 2025 NASA-MSU Professional Enhancement Award, NASA and Michigan State University (\$800)
 2024 Rated “Outstanding”, Fall 2024 List of Teachers Ranked as Excellent by Their Students, ICES
 2024 Francis M. and Harlie M. Clark Research Support Grant, SIB (\$1,000)
 2024 Rated “Outstanding”, Spring 2024 List of Teachers Ranked as Excellent by Their Students, ICES
 2024 Travel Grant, Program in Ecology Evolution, and Conservation Biology (\$700)
 2024 Conference Presentation Award, UIUC Graduate College (\$233)
 2023 Rated “Outstanding”, Fall 2023 List of Teachers Ranked as Excellent by Their Students, ICES
 2023 Field Inclusive Research Grant, Field Inclusive Incorporated (\$500)
 2023 The Harvey J. Van Cleave Research Award, School of Integrative Biology (SIB; \$1,500)
 2023 Program in Ecology, Evolution, and Conservation Biology Summer Research Grant (\$1,500)
 2023 Honorable Mention, Predoctoral Fellowship, Ford Foundation
 2022 Graduate College Nominee, HHMI Gilliam Fellowship - University Level Competition
 2022 Departmental Nominee, HHMI Gilliam Fellowship - Department Level Competition
 2022 Graduate College Dissertation Travel Grant, UIUC Graduate College (\$4,834)
 2022 Tick University Fellowship, S.E. Center of Excellence in Vector Borne Diseases (\$500; declined)
 2022 Summer Research Grant, Program in Ecology, Evolution, and Conservation Biology (\$1,500)
 2022 The Harvey J. Van Cleave Research Award, SIB (\$1,000)
 2022 Honorable Mention, Graduate Research Fellowship Program, National Science Foundation
 2022 Honorable Mention, Predoctoral Fellowship, Ford Foundation
 2021 Illinois Mosquito & Vector Control Association Meeting (Oral), 3rd Place Award (\$100)
 2021 Research Assistantship, Natural Resources & Environmental Sciences, Support Award (\$2,500)
 2021 The Francis M. and Harlie M. Clark Research Support Grant, SIB (\$1,000)
 2021 Summer Research Award, Program in Ecology, Evolution, and Conservation Biology (\$1,000)
 2021 Graduate Mentor Award, SLU McNair Scholars Program
 2020 Summer Predoctoral Institute Certificate of Achievement, UIUC Graduate College
 2020 ASPIRE Fellowship, UIUC Graduate College, (full tuition and stipend, ~\$75,000)
 2020 Alumni Engagement Program Appreciation Award, SLU McNair Scholars Program
 2020 Emerging Researchers National Conference (Oral), 1st Place Award (\$300)
 2019 MO-Louis Stokes Alliance Minority for Participation Summer Scholars REU Award (\$4,000)
 2019 NIH-NIDDK STEP-UP Research Program Fellowship (\$5,000)
 2019 Missouri Louis Stokes Alliance for Minority Participation Conference, Travel Award
 2019 Emerging Researchers National Conference, Travel Award
 2018 Louis Stokes Alliance for Minority Participation Conference (Oral), 2nd Place Award (\$250)
 2018 Minority Access 19th Annual Role Models Conference (Oral), 1st Place Award (\$1,000)

- 2018 Washington University in St. Louis, Tyson Research Fellowship (\$2,500)
 2018 McNair Summer Research Scholarship (\$2,500)

Invited Public Speaking

- 2026 *future invite (03/24)*: Guest Lecturer, IB361 Ecology & Human Health, Champaign, IL
 2026 *future invite (02/27)*: All Hands Call, Midwest Center of Excellence for Vector-Borne Diseases
 2025 Presenter, Medical, Urban, and Veterinary Entomology Symposium, ESA, Portland, OR
 2025 Speaker, Entomology Colloquium, Department of Entomology, UIUC, Urbana, IL
 2025 Presenter/Panelist, Tyson Environmental Research Conference, Washington University, MO
 2024 Presenter, College Success – Illinois TRIO Day, Eastern Illinois University, Charleston, IL
 2024 Speaker, First-Generation Graduate Student Success, Geis School of Business, Champaign, IL
 2024 Panelist, Grant Winner Spark Moment Webinar and Q&A, Field Inclusive Incorporated, Zoom
 2023 Panelist, NIH-NIDDK STEP-UP Summer Enrichment Series, Zoom
 2023 Guest Lecturer, IB361 Ecology & Human Health, Champaign, IL.
 2023 Panelist, Plenary Panel, AAAS/NSF Emerging Researchers National Conference, D.C.
 2022 Panelist, McNair Alumni & Career Panel, Summer Research Institute, University of Illinois, IL
 2022 Panelist, Summer Research Internship Alumni Panel, St. Louis University, MO
 2022 Guest Lecturer, IB361 Ecology & Human Health, Champaign, IL
 2021 Panelist, NIH-NIDDK STEP-UP Informational Webinar – Part 1 & 2, Zoom
 2021 Panelist, TRIO-SSS McNair Info Session, Washington University, Zoom
 2020 Panelist, Graduate Student Panel: Discussing the Value of REUs, Lee University, Zoom
 2020 Panelist, Alumni Engagement Program Virtual Panel, SLU McNair, Zoom
 2019 Panelist, McNair Welcome Event, St. Louis, MO
 2019 Panelist, Gateway Regional Math Alliance, St. Louis, MO
 2019 Panelist, Spark the Mind: Advancing the Agenda for African Americans in STEM, St. Louis, MO
 2018 Speaker, McNair Scholars Program Luncheon, St. Louis, MO
 2018 Master of Ceremonies, HSSU MSEIP Conference, Alton, IL

Research Presentations

- 2025 McFarland, Derek; Allan, Brian. (Oral). **Illinois Mosquito & Vector Control Association**, Champaign, IL.
 2025 McFarland, Derek; Allan Brian. (Oral). **Department of Entomology Colloquium Series**, Urbana, IL.
 2025 McFarland, Derek; Allan Brian. (Oral). **Annual Tyson Environmental Research Conference**, Washington University in St. Louis, MO.
 2025 McFarland, Derek; Allan Brian. (Oral). **Program in Ecology, Evolution, Conservation Biology Exit Seminar Series**, y, Urbana, IL.
 2025 McFarland, Derek; Allan Brian. (Oral). **International Association for Landscape Ecology-North America Annual Meeting**, Raleigh, NC.
 2024 McFarland, Derek; Allan Brian. (Oral). **Ecological Society of America**, Long Beach, CA.
 2023 McFarland, Derek; Allan Brian. (Oral). **Graduates in Ecology and Evolutionary Biology Symposium**, Urbana, IL.
 2023 McFarland, Derek; Allan, Brian. (Oral). **Infectious Genomics for One Health**, Urbana-Champaign, IL.

- 2022 McFarland, Derek; Allan, Brian. (Oral). **Illinois Mosquito & Vector Control Association**, Northbrook, IL.
- 2022 McFarland, Derek; Allan, Brian. (Poster). **Geo-Resolution: Geospatial Perspectives on Climate Change: Predicting and Mitigating Effects**, St. Louis, MO.
- 2021 McFarland, Derek; Allan, Brian. (Oral). **Illinois Mosquito & Vector Control Association**, Northbrook, IL.
- 2020 McFarland, Derek; Allan, Brian. (Oral). **Research and Action Plan – Summer Predoctoral Institute Symposium**, via Zoom.
- 2020 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Poster). **Emerging Researchers National Conference**, Washington, D.C.
- 2019 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Poster). **Annual Biomedical Research Conference for Minority Students**, Anaheim, CA.
- 2019 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Poster). **Washington University Undergraduate Research Symposium**, St. Louis, MO.
- 2019 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Poster). **American Society of Parasitologists Meeting**, Rochester, MN.
- 2019 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Oral & Poster). **NIH/NIDDK STEP-UP Research Symposium**, Bethesda, MD.
- 2019 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Oral). **MOLSAMP Conference**, Jefferson, MO.
- 2019 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Oral). **Emerging Researchers National Conference**, Washington, D.C.
- 2018 McFarland, Derek. (Poster). **Minority Science Engineering Improving Program Conference**, Alton, IL.
- 2018 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Oral). **Minority Access 19th Annual Role Models Conference**, Washington, D.C.
- 2018 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Oral). **Heartland (MOKANNE) Conference**, Kansas City, MO.
- 2018 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Poster). **Washington University Undergraduate Research Symposium**, St. Louis, MO.
- 2018 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Oral). **Inland Bird Bander’s Association Meeting**, STL, MO.
- 2018 McFarland, Derek; Soares, Letícia; Adalsteinsson, Solny. (Oral). **McNair Summer Research Symposium**, St. Louis, MO.

Analytical and Technical Skills

Software: Geographic Information Systems (ArcGIS Pro/ArcMap, Fragstats), R programming (RStudio)

Wet Lab: Quantitative reverse transcriptase-Polymerase Chain Reaction, cDNA synthesis, DNA-/RNA-extraction, Gel-electrophoresis, Geimsa staining

Field: Taxonomic tick identification, Tick sampling (carbon-dioxide trapping, tick dragging and flagging), Mist-netting (bird capture and banding), Woodland bird identification (Midwestern-Eastern US), Avian phlebotomy (blood extraction), Avian blood smear preparation and analysis

Relevant Graduate Coursework

Statistical Analysis

IB 496 *Analysis of Biological Data in R*

NRES 421 *Quantitative Methods in Statistics*

NRES 454 *GIS Natural Resources Management*

NRES 455 *Advanced GIS for Natural Resources Management*

Biological Sciences

CB 540 *Wildlife Ecosystem Health*

IB 453 *Community Ecology*

IB 461 *Ornithology*

Professional Memberships

Entomological Society of America (ESA)

International Association for Landscape Ecology, North America (IALE-North America)

Ecological Society of America (ESA)

Field Inclusive (FI) Inc.

American Ornithological Society (AOS)

Kappa Mu Epsilon (KME), Missouri Mu Chapter

American Society of Parasitologists (ASP)