Jeffrey W. Doser **Last update: July 25, 2024**

CONTACT INFORMATION

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GitHub: https://github.com/doserjef

RESEARCH INTERESTS

Statistical Ecology, Forest and Wildlife Management, Bayesian Modeling, Spatial Statistics

EDUCATION

Michigan State University, East Lansing, MI

- **Ph.D., Forestry and Ecology, Evolution, and Behavior** 2018-2022
  - Dissertation title: Development and application of hierarchical models for monitoring avian soundscapes, populations, and communities
  - Advisor: Andrew O. Finley
- **M.S., Applied Statistics** (non-thesis degree) 2018-2021

State University of New York at Geneseo, Geneseo, NY.

- **B.S. Mathematics and Biology** Summa Cum Laude 2014-2018

ACADEMIC EXPERIENCE

Assistant Professor, North Carolina State University 2024 - Current

- Department of Forestry and Environmental Resources

Postdoctoral Research Associate, Michigan State University 2022 - 2024

- Department of Integrative Biology
- Institute of Biodiversity, Ecology, Evolution, and Macrosystems
- Advisor: Elise F. Zipkin

Graduate Research Assistant, Michigan State University 2018-2022

- Department of Forestry
- Advisor: Andrew O. Finley

PEER REVIEWED PUBLICATIONS

UNDER REVIEW

24. Dean, C.D., Chiarenza, A.A., **Doser, J.W.**, Farnsworth, A., Jones, L.A., Lyster, S., Outhwaite, C.L., Butler, R.J., Mannion, P.D. Sampling heterogeneity shapes interpretations of the end-Cretaceous dinosaur fossil record. *Science Advances. In review.*
23. Youngflesh, C., Kapsar, K., Uscanga, A., Williams, P.J., **Doser, J.W.**, Kounta, L., Zarnetske, P.L. Environmental variability shapes life history of the world's birds. *Ecology Letters. In review.*
22. Quinlan, G.M., **Doser, J.W.**, Kammerer, M., Grozinger, C.M. Estimating genus-specific effects of non-native honey bees and urbanization on wild bee communities in the Eastern United States. *Science of the Total Environment. In review after major revision.*
21. Kellner, K.F., **Doser, J.W.**, Belant, J.L. Functional and reproducible code is rare in ecology papers. *Ecology. In review.*

2024

20. **Doser, J.W.**, Finley, A.O., Kéry, M., Zipkin, E.F. `spAbundance`: An R package for single-species and multi-species spatially-explicit abundance models. *Methods in Ecology and Evolution.* https://doi.org/10.1111/2041-210X.14332.
19. Gilbert, N.A., Amaral, B.R., Smith, O.M., Williams, P.J., Ceyzyk, S., Ayebare, S., Davis, K.L., Leuenberger, W., **Doser, J.W.**, Zipkin, E.F. (2024). A century of statistical Ecology. *Ecology.* http://doi.org/10.1002/ecy.4283.

18. **Doser, J.W.**, Kéry, M., Saunders, S.P., Finley, A.O., Bateman, B.L., Grand, J., Reault, S., Weed, A.W., Zipkin, E.F. (2024). Guidelines for the use of spatially-varying coefficients in species distribution models. *Global Ecology and Biogeography*. 33, e13814. https://doi.org/10.1111/geb.13814.

17. Bajcz, A.W., Glisson, W.J., **Doser, J.W.**, Larkin, D.J., Fieberg, J.R. (2024). A within-lake occupancy model for starry stonewort, a stealthy aquatic invader, to support early detection and monitoring. *Scientific Reports*. 14, 2644. https://doi.org/10.1038/s41598-024-52608-0.

16. Kovalenko, V.*, **Doser, J.W.**, Bate, L.J., Six, D.L. (2024). Paired acoustic recordings and point count surveys reveal Clark's nutcracker and whitebark pine associations across Glacier National Park. *Ecology and Evolution*, 14, e10867. https://doi.org/10.1002/ece3.10867. **Graduate student mentee.*

15. **Doser, J.W.**, Finley, A.O., Saunders, S.P., Kéry, M., Weed, A.W., Zipkin, E.F. (2024). Modeling complex species-environment relationships through spatially-varying coefficient occupancy models. *Journal of Agricultural, Biological, and Environmental Statistics*. https://doi.org/10.1007/s13253-023-00595-6 .

14. Zipkin, E.F., **Doser, J.W.** (2024). Context matters in ecological forecasting: Lessons in predicting species distributions. *Global Change Biology*. 30(1), e17123. https://doi.org/10.1111/gcb.17123.

13. **Doser, J.W.**†, Stoudt, S.† (2024). "Fractional replication" in single-visit multi-season occupancy models: Impacts of spatio-temporal autocorrelation on identifiability. *Methods in Ecology and Evolution*. https://doi.org/10.1111/2041-210X.14275. †*Authors contributed equally.*

12. Roberts, C.P., **Doser, J.W.**, Berry, L.L., Fowler, A., Marshall, P.M., Middaugh, C., Rowe, K., Schmit, J., Shaw, M., Wilson, K. (2024). Scenario planning and multi-species occupancy models reveal positive avian responses to restoration of afforested woodlands. *Restoration Ecology*. 32(1) e13998. https://doi.org/10.1111/rec.13998.

2023

11. Zipkin, E.F., **Doser, J.W.**, Davis, C.L., Leuenberger, W.L., Ayebare, S., Davis, K.L (2023). Integrated community models: A framework combining multi-species data sources to estimate the status, trends, and dynamics of biodiversity. *Journal of Animal Ecology*. 92(12) 2248-2262. https://doi.org/10.1111/1365-2656.14012.

10. Ayebare, S.*, **Doser, J.W.**, Plumptre, A., Owiunji, I., Mugabe, H., Zipkin, E.F (2023). An environmental habitat gradient and within-habitat segregation enable co-existence among ecologically similar bird species. *Proceedings of Royal Society B*. 290(2005), 20230467. https://doi.org/10.1098/rspb.2023.0467. **Graduate student mentee.*

9. **Doser, J.W.**, Finley, A.O., Banerjee, S (2023). Joint species distribution models with imperfect detection for high-dimensional spatial data. *Ecology*. 104(9): e4137. https://doi.org/10.1002/ecy.4137.

2022

8. **Doser, J.W.**, Finley, A.O., Kéry, M., Zipkin, E.F (2022). `spOccupancy`: An R package for single-species, multi-species, and integrated spatial occupancy models. *Methods in Ecology and Evolution*. 13(8), 11670-1678. https://doi.org/10.1111/2041-210X.13897.

7. **Doser, J.W.**, Leuenberger, W., Sillett, T.S., Hallworth, M.T., Zipkin, E.F (2022). Integrated community occupancy models: A framework to assess occurrence and biodiversity dynamics using multiple data sources. *Methods in Ecology and Evolution*. 13(4), 919-932. https://doi.org/10.1111/2041-210X.13811.

2021

6. **Doser, J.W.**, Weed, A.S., Zipkin, E.F., Miller, K.M., Finley, A.O. (2021). Trends in bird abundance differ among protected forests but not bird guilds. *Ecological Applications* 31(6):e02377. https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1002/eap.2377.

5. **Doser, J.W.**, Finley, A. O., Weed, A. S., Zipkin, E. F. (2021). Integrating automated acoustic vocalization data and point count surveys for estimation of bird abundance. *Methods in Ecology and Evolution*, 12(6), 1040-1049. https://doi.org/10.1111/2041-210X.13578.

4. Hoffmann, H.M., Meadows, J.D., Breuer, J.A., Yaw, A.M., Nguyen, D., Tonsfeldt, K.J., Chin, A.Y., Devries, B.D., Khan, R., Trang, C., Oosterhouse, H.J., Sora Lee, J., **Doser, J.W.**, Gorman, M. R., Welsh, D.K., Mellon, P. L. (2021). The transcription factors VAX1 and SIX3 are required for suprachiasmatic nucleus circadian output and fertility in female mice. *Journal of Neuroscience Research*. https://doi.org/10.1002/jnr.24864.

2020

3. Teimouri, M., **Doser, J.W.**, Finley A.O. (2020) `ForestFit`: An R package for modeling plant size distributions. *Environmental Modelling & Software*, 131, 104668. https://doi.org/10.1016/j.envsoft.2020.104668.

2. **Doser, J.W.**, Finley, A.O., Kasten, E.P., Gage, S.H. (2020). Assessing soundscape disturbance through hierarchical models and acoustic indices: A case study on a shelterwood logged northern Michigan forest. *Ecological Indicators*, 113, 106244. https://doi.org/10.1016/j.ecolind.2020.106244.

1. **Doser, J.W.**, Hannam, K.M., Finley, A.O. (2020). Characterizing functional relationships between anthropogenic and biological sounds: A western New York state soundscape case study. *Landscape Ecology*, 35(3), 689-707. https://doi.org/10.1007/s10980-020-00973-2.

In preparation

- **Doser, J.W.**, Edwards, M., Zipkin, E.F., Jennelle, C.S. Estimating spatially varying occupancy trends for multi-scale conservation: An amphibian case study in the midwestern United States. *To be submitted to Journal of Applied Ecology.*
- **Doser, J.W.**, Finley, A.O. Multivariate spatial models for small area estimation of species-specific forest inventory parameters. *To be submitted to Canadian Journal of Forest Research.*
- **Doser, J.W.**, Itter, M.S., Domke, G.M, Zipkin, E.F., Finley, A.O. Projected increases in vapor pressure deficit forecast substantial tree biomass declines across species in the western US. *To be submitted to Global Change Biology.*

Teaching Experience

Course Instructor

- North Carolina State University
  - FOR 374 Forest Measurement, Modeling, and Inventory — Fall 2024-Current
- Michigan State University
  - FOR/STT 875 R Programming for Data Sciences — Summer 2020-2022
  - IBIO 831 Statistical Methods in Ecology and Evolution — Spring 2022

Workshops and Webinars

- Hierarchical spatial modelling for applied population and community ecology — 2024
  - Swiss Ornithological Institute. Sempach, Switzerland. *Invited.*
  - June 24-27, 2024 (4 days).
  - Open-source materials.
- Introduction to applied Bayesian analysis in wildlife ecology — 2024
  - The Wildlife Society. Remote. *Invited.*
  - May 11, 2024 (1 day).
  - Open-source materials.
- Spatially-explicit occupancy modeling with the spOccupancy R package — 2023
  - The Wildlife Society Annual Conference. Louisville, Kentucky.
  - November 9, 2023 (1 day).
  - Open-source materials.
- Scalable Bayesian models and estimation methods for the analysis of big spatial data — 2023
  - Conference on Applied Statistics and Natural Resources. West Lafayette, Indiana. *Invited.*
  - May 15, 2023 (1 day).
  - Open-source materials.
- Spatially-explicit occupancy modeling with the `spOccupancy` R package. — 2022

  - Ecological Society of America Statistical Ecology Webinar Series. Remote. *Invited.*
  - October 3, 2022 (1.5 hours).
  - Recording and open-source materials.
- Bayesian occupancy modeling with the `spOccupancy` R package 2022
  - Living Landscapes Lab. University of Arkansas. Remote. *Invited.*
  - July 20, 2022 (1 hour).
- Bayesian occupancy modeling with the `spOccupancy` R package 2022
  - Tel Aviv University. Tel Aviv, Israel.
  - July 27, 2022 (1 hour).
- Bayesian occupancy modeling with acoustic data in `spOccupancy` 2022
  - Cornell Acoustic Methods Working Group Series. Remote. *Invited.*
  - July 19, 2022 (1 hour).
  - Recording and Open-source materials.

Teaching Assistant

- Michigan State University
  - FOR/STT 875 R Programming for Data Sciences Summer 2018-2020
  - FOR 472 Ecological Monitoring and Data Analysis Fall 2018
- State University of New York at Geneseo
  - BIOL 116 Introductory Biology Laboratory Fall 2016

Guese Lecturer

- Michigan State University
  - IBIO 860: Modern Statistical Models in Ecology Spring 2023
    - Two guest lectures on capture-recapture models

Books Under Contract

Finley, A.O. and **Doser, J.W.** *Introduction to Forestry Data Analysis with R.* Chapman & Hall CRC. Expected publication date: 2025. Draft available at https://www.jeffdoser.com/files/ifdar/.

Software

`spAbundance`. **Doser, J.W.**, Finley, A.O. (Oct 2023 - current). Univariate and Multivariate Spatial Modeling of Species Abundance. Downloaded 3,360 times as of July 25, 2024. `https://cran.r-project.org/web/packages/spAbundance/index.html`.

`spOccupancy`. **Doser, J.W.**, Finley, A.O. (Nov 2021 - current). Single-species, Multi-species, and Integrated Spatial Occupancy Models. Downloaded 17,612 times as of July 25, 2024. `https://cran.r-project.org/web/packages/spOccupancy/index.html`.

Grants and Scholarships

Funded: USDA Agriculture and Food Research Initiative: *A national-scale early detection and ecosystem service impact assessment tool for invasive plants.* Statistical consultant. 2023-2027. ($650,000)

Funded: NSF, DEB, Collaborative Research MRA: *Estimating and forecasting nonstationary, multi-scale climate and land-use effects on avian communities.* Postdoctoral Researcher. 2023-2028. ($1,306,419)

Funded: US National Park Service. *Developing spatially explicit integrated models to evaluate avian distributions and regional bird population dynamics in eastern US National Parks.* Postdoctoral Researcher and Graduate Student Mentor. 2022-2026. ($228,084)

Not selected: Northeast Climate Adaptation Science Center, USGS. *Improving bird and bat conservation in forest resilience planning: A Northeast climate change adaptation strategy.* Postdoctoral Researcher.

Barry M. Goldwater Scholarship. 2017-2018. ($7,500)

Dr. Wendell and Barbara Rhodes Research Award. 2016. ($8,150)

Geneseo Foundation Scholarship. 2014-2018. ($65,000)

Awards and Honors

David R. Anderson Outstanding Student Paper Award, Biometrics Working Group, The Wildlife Society 2022

SUNY Chancellor's Award for Student Excellence 2018

Excellence in Mathematics, SUNY Geneseo 2018

Dr. Sam Molnar Scholar Athlete Award, SUNYAC 2018

James Fulton Award for Academic and Athletic Excellence, SUNYAC 2018

Phi Beta Kappa Honors Society, SUNY Geneseo 2017

SUNY Chancellor's Scholar-Athlete Award 2016-2018

Edgar Fellows Honors Program 2014–2018

University Service

Ecology, Evolution, and Behavior Program Research Symposium Chair, Michigan State University, 2021-2022

Ecology, Evolution, and Behavior Program Graduate/Postdoc Awards Committee, Michigan State University, 2020-2022

Ecology, Evolution, and Behavior Program Research Symposium Committee, Michigan State University 2021

Treasurer, Graduate Student Organization, Department of Forestry, Michigan State University 2019-2020

Student Athlete Advisory Committee, SUNY Geneseo 2015-2018

Editorial Service

Peer Reviews: *Nature Ecology and Evolution* (1), *Current Biology* (2), *Methods in Ecology and Evolution* (9), *Ecological Monographs* (2), *Ecological Applications* (1), *Ecography* (5), *Ecology* (2), *Conservation Biology* (4), *Landscape Ecology* (1), *Biological Invasions* (1), *Diversity and Distributions* (2), *Ecological Indicators* (2), *Forest Ecology and Management* (1), *Animal Conservation* (2), *PLOS Computational Biology* (1), *Ecological Solutions and Evidence* (2), *Ecology and Evolution* (2), *Ornithological Applications* (2), *Biometrics* (2), *Environmental DNA* (1), *Biodiversity and Conservation* (1), *Avian Conservation and Ecology* (1), *Ecosphere* (1), *Journal of Ornithology* (1), *Insect Conservation and Biodiversity* (1), *PLOS ONE* (1), *Ekológia* (1)

Invited Seminars and Presentations

Doser, J.W. Advances in hierarchical spatial modeling for biodiversity conservation. August 2024. The University of Queensland Centre for Biodiversity and Conservation Science Seminar Series. Zoom.

Doser, J.W., Saunders, S.P., Reault, S., Bateman, B.L., Grand, J., Zipkin, E.F. July 2024. Integrated community occupancy modeling to improve estimates of population and community change. Joint Meeting of Ichthyologists and Herpetologists. Pittsburgh, Pennsylvania, USA.

Doser, J.W. May 2024. Novel quantitative approaches for wildlife conservation in the 21st century. University of Florida. Department of Wildlife Ecology and Conservation. Gainesville, Florida, USA.

Doser, J.W. February 2024. Unraveling the complexities of biodiversity using hierarchical models. University of Toronto. Department of Ecology and Evolutionary Biology. Toronto, Canada.

Doser, J.W. January 2024. Computational advances for big spatial data with applications to biodiversity conservation. Stony Brook University Institute for Advanced Computational Science Seminar Series. Stony Brook, New York, USA.

Doser, J.W. March 2023. Unraveling the complexities of biodiversity using hierarchical models. University of Central Florida Department of Biology. Orlando, Florida, USA.

Doser, J.W., Finley, A. O., Zipkin, E. F. March 2023. High-dimensional spatial models for predicting forest biomass and bird distributions across the continental US. BayesComp 2023. Levi, Finland.

Doser, J.W. February 2023. Unraveling the complexities of biodiversity using hierarchical models. Utah State University Department of Wildland Resources. Logan, Utah, USA.

Doser, J.W. January 2023. Hierarchical models for high-dimensional ecological data across large spatial domains. Bucknell University Department of Mathematics Distinguished Visiting Professor Program. Lewisburg, Pennsylvania, USA.

Doser, J.W. November 2022. Using spatially-explicit occupancy models to understand occurrence and biodiversity patterns across macroscales. University of Arkansas Biology Seminar Series. Fayetteville, Arkansas, USA.

Doser, J.W., Finley, A.O., Banerjee, S. August 2022. Joint species distribution models with imperfect detection for high-dimensional spatial data. Joint Statistical Meetings. Washington, D.C., USA

Other Presentations

Doser, J.W., Saunders, S.P., Reault, S., Bateman, B.L., Grand, J., Zipkin, E.F. July 2024. Using integrated community occupancy models to quantify global change impacts on North American bird communities. International Statistical Ecology Conference. Swansea, Whales, UK.

Doser, J.W., Leuenberger, W., Sillett, T.S., Hallworth, M.T., Zipkin, E.F. August 2022. Integrated community occupancy models: A framework to assess occurrence and biodiversity dynamics using multiple data sources. Ecological Society of America. Montréal, Canada. Oral presentation.

Doser, J.W., Leuenberger, W., Sillett, T.S., Hallworth, M.T., Zipkin, E.F. June 2022. Integrated community occupancy models: A framework to assess occurrence and biodiversity dynamics using multiple data sources. International Statistical Ecology Conference. Remote. Oral presentation.

Doser, J.W., Weed, A.S., Zipkin, E.F., Miller, K.M., Finley, A.O. July 2021. Trends in bird abundance differ among protected forests but not bird guilds. American Ornithological Society Meeting. Remote. Oral presentation.

Doser, J.W., Finley, A.O., Kasten, E. P., Gage, S. H. June 2021. Assessing soundscape disturbance through hierarchical models and acoustic indices: A case study on a shelterwood logged northern Michigan forest. International Ecoacoustics Congress. Remote. Oral presentation.

Doser, J.W., Weed, A.S., Zipkin, E.F., Miller, K.M., Finley, A.O. May 2021. Trends in bird abundance differ among protected forests but not bird guilds. Ecology, Evolution, and Behavior Program Symposium. Michigan State University. Remote. ***Awarded 2nd Place for Best Oral Presentation***.

Doser, J.W. February 2021. Forest bird monitoring using acoustic recordings and hierarchical models. Hanover Seminar Series. Department of Forestry. Michigan State University. Oral presentation.

Doser, J.W., Finley, A.O., Kasten, E. P., Gage, S. H. February 2020. Assessing soundscape disturbance through hierarchical models and acoustic indices: A case study on a shelterwood logged northern Michigan forest. Michigan State University. Oral presentation.

Doser, J.W., Hannam, K.M., Finley, A.O. September 2019. Using hierarchical Bayesian models to analyze acoustic data. XXVII International Bioacoustics Congress, Brighton, England. Oral presentation.

Doser, J.W., Hannam, K.M., Finley, A.O. May 2019. Characterizing functional relationships between biophony and technophony: a western New York soundscape case study. Northeast Regional Environmental Acoustics Symposium. Providence, RI. Oral presentation.

Doser, J.W., Meisel, D.D. April 2018. Developing an automated bird song recognition system using wavelets and simple machine learning techniques. Geneseo Recognizing Excellence, Achievement and Talent Day, Geneseo, NY. Oral presentation.

Doser, J.W., Hannam, K.M. October 2017. Using soundscape maps to assess a local soundscape. Middle States Division American Association of Geographers Annual Meeting, Geneseo, NY. Poster presentation.

Doser, J.W., Hannam, K.M. April 2017. Analysis of seasonal temporal variation of soundscapes in western New York. Northeast Natural History Conference, Cromwell, CT. Oral presentation.

Doser, J.W., Hannam, K.M. August 2016. Use of soundscape recordings to analyze daily temporal variation in avian vocalizations in western New York. North American Ornithological Conference, Washington D.C. Poster presentation.

Professional Positions

Statistical Consultant, Michigan State University 2019-2020

- College of Agriculture and Natural Resources Statistical Consulting Center
- Provided statistical and programming guidance to undergraduate students, graduate students, and faculty members.

Student Database Programmer, SUNY Geneseo 2016-2018

- Computing and Information Technologies Department
- Developed, modified, and tested Banner applications using SQL, Groovy, SQR, and the Argos Enterprise Reporting System

Relevant Skills

Programming Languages/Statistical Software: R, C++, C, JAGS, NIMBLE, Stan

Software: Latex/Knitr, R Markdown/bookdown, R Shiny

Graduate Students Mentored

Bruna Amaral, Michigan State University 2022-2024

Wendy Leuenberger, Michigan State University 2022-2024

Vladimir Kovalenko, University of Montana 2022-2023

Samuel Ayebare, Michigan State University 2022

Outreach

Volunteer, Delta 4H Wildlife Club, East Lansing, MI Sping 2019

Guest Speaker, French Road Elementary School, Brighton, NY 2018

- Discussed applications of Raspberry Pi computers and how to use them for sound recording.

Affiliations

The Wildlife Society 2022-current

American Statistical Association 2019-current

Ecological Society of America 2021-current

American Ornithological Society 2021-2023

International Society of Ecoacoustics 2019-2022

References

Andrew O. Finley
Michigan State University
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Elise F. Zipkin
Michigan State University
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Marc Kéry
Swiss Ornithological Institute
E-mail: marc.kery@vogelwarte.ch

Aaron S. Weed
U.S. National Park Service
E-mail: aaron_weed@nps.gov