Gideon Bradburd

3042 Biological Sciences Building
Department of Ecology & Evolutionary Biology
University of Michigan

email: bradburd@umich.edu
website: genescape.org
software: github.com/gbradburd

EDUCATION & APPOINTMENTS

Asst. Professor	*University of Michigan* Department of Ecology and Evolutionary Biology	2022 - present
Asst. Professor	*Michigan State University* Department of Integrative Biology Ecology, Evolution, and Behavior Program fixed-term (2016-17); tenure-stream (2017-2022)	2016 - 2022
Postdoc	*University of California, Berkeley* Museum of Vertebrate Zoology Department of Env. Sci. Pol. and Mgmt Advisors: Michael Nachman, Bree Rosenblum	2015 - 2016
PhD	*University of California, Davis* Population Biology Graduate Group Department of Ecology and Evolutionary Biology Advisors: Graham Coop, Brad Shaffer	2009 - 2015
Bachelor of Science	*Yale University* Ecology and Evolutionary Biology Honors Thesis Advisor: Tom Near	2004 - 2008

LEAVES & MODIFIED DUTIES

2020	Second child born in Aug, 6 weeks parental leave, teaching release Spring Semester 2021
2016	First child born in November, 3 weeks parental leave, one-year tenure clock extension

PUBLICATIONS

*advisees (e.g., students/postdocs)

Preprints, In Review, and In Revision

*Grundler, MC, J Terhorst, GS Bradburd. **2024**. A geographic history of human genetic ancestry. bioRxiv.

*Clark, MI, SW Fitzpatrick, GS Bradburd. **2024**. Pitfalls and windfalls of detecting demographic declines using population genetics in long-lived species. bioRxiv.

*Hancock, Z, *RH Toczydlowski, GS Bradburd. **2023**. A spatial approach to jointly estimate Wright's neighborhood size and long-term effective population size. *(in revision)*. bioRxiv.

Published and Accepted

26. *Lewanski, AL, *MC Grundler, GS Bradburd. **2024**. The era of the ARG: An introduction to ancestral recombination graphs and their significance in empirical evolutionary genomics. **PLoS Genetics**. 20(1): e1011110.

25. *Week, B and GS Bradburd. **2024**. Host-parasite coevolution in continuous space leads to variation in local adaptation across spatial scales. **American Naturalist** 203:1, 43-54.

24. Mathur, S, A Mason, GS Bradburd, HL Gibbs. **2023**. Functional genomic diversity is correlated with neutral genomic diversity in populations of an endangered rattlesnake. **Proceedings of the National Academy of Sciences** 120 (43).

23. Crandall, ED, *RH Toczydlowski, L Liggins, AE Holmes, M Ghoojaei, MR Gaither, BE Wham, AL Pritt, C Noble, TJ Anderson, RL Barton, JT Berg, SG Beskid, A Delgado, E Farrell, N Himmelsbach, SR Queeno, T Trinh, C A Weyand, A Bentley, J Deck, C Riginos, GS Bradburd, RJ Toonen. **2023**. The importance of timely metadata curation to the global surveillance of genetic diversity. **Conservation Biology** 37, e14061.

22. Martin, BS, GS Bradburd, LJ Harmon, MG Weber. **2022**. Modeling the evolution of rates of continuous trait evolution. **Systematic Biology** 72 (3), 590-605.

21. *Clark, M, GS Bradburd, M Akopyan, A Vega, E Rosenblum, J Robertson. **2022**. Genetic isolation by distance underlies color pattern divergence in red-eyed treefrogs (*Agalychnis callidryas*). **Molecular Ecology**. 31: 1666-1681.

20. *Toczydlowski, RH, L Liggins, MR Gaither, TJ Anderson, RL Barton, JT Berg, SG Beskid, B Davis, A Delgado, E Farrell, M Ghoojaei, N Himmelsbach, AE Holmes, SR Queeno, T Trinh, CA Weyand, GS Bradburd, C Riginos, RJ Toonen, ED Crandall. **2021**. Poor data stewardship will hinder global genetic diversity surveillance. **Proceedings of the National Academy of Sciences** 118 (34).

19. *Puckett, E, S Murphy, GS Bradburd. **2021**. Phylogeographic analysis delimits three evolutionary significant units of least chipmunks in North America and identifies unique genetic diversity within the imperiled Peñasco population. **Ecology and Evolution** 11: 12114-12128.

18. Schweizer, RS, MR Jones, GS Bradburd, JF Storz, N Senner, C Wolf, ZA Cheviron. **2021**. Broad concordance in the spatial distribution of adaptive and neutral genetic variation along an elevational cline in deer mice. **Molecular Biology and Evolution** 38 (10), 4286-4300.

17. *Hancock, ZB, ES Lehmberg, GS Bradburd. **2021**. Neo-darwinism still haunts evolutionary theory: A modern perspective on Charlesworth, Lande, and Slatkin (1982). **Evolution** 75: 1244-1255.

16. Rothstein, A, R Knapp, GS Bradburd, D Boiano, EB Rosenblum. **2020**. Stepping into the past to conserve the future: archived skin swabs from extant and extinct populations inform genetic management of an endangered amphibian. **Molecular Ecology** 29 (14): 2598-2611.

15. Fitzpatrick, SW GS Bradburd, CT Kremer, PE Salerno, LM Angeloni, WC Funk. **2020**. Genomic and fitness consequences of genetic rescue in wild populations. **Current Biology** 30: 1-6.

14. Schweizer, RM, JP Velotta, CM Ivy, MR Jones, SM Muir, GS Bradburd, JF Storz, GR Scott, ZA Cheviron. **2019**. Physiological and genomic evidence that a transcription factor contributes to adaptive cardiovascular function in high-altitude deer mice. **PLoS Genetics** 15 (11), e1008420-e1008420.

13. Bradburd, GS and PL Ralph. **2019**. Spatial population genetics: It's about time. **Annual Reviews in Ecology, Evolution, and Systematics** 50: 427-449.

12. Grieneisen, LE, MJE Charpentier, SC Alberts, R Blekhman, GS Bradburd, J Tung, EA Archie. **2019**. Genes, geology, and germs: gut microbiota across a primate hybrid zone are explained by site soil properties, not host species. **Proceedings of the Royal Society B** 286: 20190431.

11. Bradburd, GS, GM Coop, and PL Ralph. **2018**. Inferring continuous and discrete population genetic structure across space. **Genetics** 210: 33-52.

10. Weber, JN, GS Bradburd, YE Stuart, WE Stutz, DI Bolnick. **2017**. Partitioning the effects of isolation by distance, environment, and physical barriers on genomic divergence between parapatric threespine stickleback. **Evolution** 71: 342-56.

9. Hoban, S, JL Kelley, KE Lotterhos, MF Antolin, GS Bradburd, DB Lowry, ML Poss, LK Reed, A Storfer, MC Whitlock. **2016**. Finding the genomic basis of local adaptation in non-model organisms: pitfalls, practical solutions, and future directions. **American Naturalist** 188: 379-397.

8. Bradburd, GS, PL Ralph, GM Coop. **2016**. A spatial framework for understanding population structure and admixture. **PLoS Genetics** 12: e1005703.

7. Hammock, BG, S Lesmeister, I Flores, GS Bradburd, FH Hammock, SJ Teh. **2016**. Low food availability narrows the tolerance of the copepod *Eurytemora affinis* to salinity, but not to temperature. **Estuaries and Coasts**. 39: 189-200.

6. Agrawal, AA, AP Hastings, GS Bradburd, EC Woods, T Züst, J Harvey, T Bukovinszky. **2015**. Evolution of plant growth and defense in a continental introduction. **American Naturalist** 186: 1-15.

5. Wang, IJ†and GS Bradburd†. **2014**. Isolation by environment. **Molecular Ecology** 23: 5649-5662. (†co-first authors)

4. Bradburd, GS, PL Ralph, and GM Coop. **2013**. Disentangling the effects of geographic and ecological isolation on genetic differentiation. **Evolution** 67: 3258-3273.

3. Rejmanek, D, P Freycon, GS Bradburd, J Dinstell, and J Foley. **2013**. Unique strains of *Anaplasma phagocytophilum* segregate among diverse questing and non-questing *Ixodes* tick species in the western United States. **Ticks and Tick-borne Diseases** 4: 482-487.

2. Rejmanek, D, GS Bradburd, and J Foley. **2012**. Molecular characterization reveals distinct genospecies of *Anaplasma phagocytophilum* from diverse North American hosts. **Journal of Medical Microbiology** 61: 204-212.

1. Near, TJ, CM Bossu, GS Bradburd, RL Carlson, RC Harrington, PR Hollingsworth Jr., BP Keck, DA Etnier. **2011**. Phylogeny and temporal diversification of darters (*Percidae: Etheostomatinae*). **Systematic Biology** 60: 565-595.

Other

Shaffer, HB, E McCartney-Melstad, PL Ralph, GS Bradburd, E Lundgren, J Vu, B Hagerty, F Sandmeier, C Weitzman, CR Tracy. Desert Tortoises in the genomic age: population genetics and the landscape. bioRxiv (Public comment on Desert Renewable Energy Conservation Plan).

FUNDING

External

NSF Division of Environmental Biology Award# 2223962 (2022-2026) **$1,536,017**
The interaction of selection, pleiotropy, and drift in phenotypic evolution
(PI: J Conner; co-PIs: G Bradburd, R Last, T Juenger)

NIH NIGMS Early Stage Investigator MIRA (R35) Award# R35GM137919 (2020-2025) **$1,849,678**
Incorporating geography into statistical methods for analysis of population genomic DNA
(PI: G Bradburd)

NSF Bridging Ecology & Evolution Award# 2016569 (2020-2024) **$920,700**
Testing eco-evolutionary effects of genetic drift and gene flow in stressful environments
(PI: S Fitzpatrick; co-PIs: B Rothermel, G Bradburd)

NSF Dimensions of Biodiversity (2017-2022) **$1,118,520**
Diversification of sensory systems in novel habitat
(PI: J Boughman; co-PIs: G Bradburd, H Hofmann, J Keagy, D Stenkamp)

NSF Doctoral Dissertation Improvement Grant (DDIG) (2014-15) **$13,918**
The effect of intraspecific host variation on the structure of parasite populations
(PI: G Bradburd; co-PI: G Coop)

Internal

MSU Strategic Partnership Grant (2021-2022) **$400,000**
The Institute for Biodiversity, Ecology, Evolution, and Macrosystems (IBEEM)
(PI: PL Zarnetske. co-PIs: KS Cheruvelil, E Zipkin, KM Dahlin, G Bradburd, J Robinson)

$127,579

Beacon - NSF Center for the Study of Evolution in Action (2016-2021)
Evolution of sensory systems in response to loss of visual information
(PI: J Boughman, co-PIs: G Bradburd, H Hofmann, J Keagy, D Stenkamp)

SOFTWARE

Bradburd, GS (2018). **conStruct**. A genetic clustering method that accounts for isolation by distance. R package version v1.0.3. https://cran.r-project.org/web/packages/conStruct/index.html

Bradburd, GS (2016). **SpaceMix**. A program for estimating geogenetic maps from allele frequency data. R package version 0.13. https://github.com/gbradburd/SpaceMix

Bradburd, GS (2013). **BEDASSLE**. Bayesian Estimation of Differentiation in Alleles by Spatial Structure and Local Ecology. R package version 1.5. https://cran.r-project.org/web/packages/BEDASSLE

MENTORSHIP & ADVISING

Postdocs

Mike Grundler 2022-present
Zach Hancock 2021-present
Leonard Jones 2021-present
Phil Gerrish 2022-2024
current position: Researcher, Los Alamos National Lab
Bob Week 2020-2022
current position: Postdoctoral Researcher, University of Oregon
Rachel Toczydlowski 2019-2022
current position: Research Landscape Geneticist, US Forest Service
Matteo Tomasini 2019-2021
current position: Research Software Engineer, University of Gothenburg
Kelsey Yule 2018-2019
current position: Project Manager of the NEON Biorepository, Arizona State University
Emily Puckett 2017 - 2018
current position: Asst. Professor of Biological Sciences, U. Tennessee, Memphis

Graduate Students

Meaghan Clark 2019-present
Alex Lewanski 2022-present

Graduate student committees

Kiran Kumar, PhD, Biostatistics, University of Michigan 2024-present
Tristan Schramer, PhD, EEB, University of Michigan 2024-present
Teresa Sauer, PhD, EEB, University of Michigan 2024-present
Yu Kai Tan, PhD, EEB, University of Michigan 2023-present
Sofia Maria Backlund, PhD, Institute of Science and Technology (Vienna) 2023-present
Jimmy Bingman, PhD, Plant Biology, MSU 2023-present
Matheus Januario Lopes de Sousa, PhD, EEB, University of Michigan 2022-present
Enes Dilber, PhD, Statistics, University of Michigan 2022-2023

Kyle Teller, PhD, Integrated Applied Math, University of New Hampshire	2020-2022
Bruce Martin, PhD, Plant Biology, MSU	2019-present
Michael Foisy, Msc, Plant Biology, MS)	2019-2020
Sara Hugentobler, PhD, Integrative Biology, MSU	2019-2022
Devin Lake, PhD, Integrative Biology, MSU	2019-2022
Jason Olsen, PhD, Plant Biology, MSU	2018-2023
Viviana Ortiz Londono, PhD, Plant Pathology, MSU	2018-2022
Miranda Wade, PhD, Integrative Biology, MSU	2018-2022
Ava Garrison, PhD, Plant Biology, MSU	2017-2022
Dr. Emily Dolson, PhD, Computer Science and Engineering, MSU	2017-2019

HONORS, AWARDS, & FELLOWSHIPS

Fitch Award Finalist, Society for Molecular Biology and Evolution ($2000)	2015
Hamilton Award Finalist, Society for the Study of Evolution ($500)	2015
XSEDE SuperComputing Resource Allocation, XSEDE (50,000 SUs)	2014-05
Center for Population Biology Research Fellowship CPB, UC Davis ($4,000)	2011-13
NSF Graduate Research Fellow National Science Foundation ($90,000)	2010-12
Graduate Scholars Fellowship in Population Biology, UC Davis ($30,000)	2009-10

TEACHING

Introduction to Statistical Model Building in R (EEB 429)	Instructor	2023-present
Evolution (EEB 390)	Instructor	2023-present
Evolutionary Biology (IBio 849)	Instructor	2018-2022
Intro to Statistical Methods in Ecology/Evolution (IBio 830)	Instructor	2017-2022
Evolution Discussion Group (IBio 895)	Instructor	2017-present

SERVICE & LEADERSHIP

National/International/Society Service

Organizer SMBE Symposium: "Spatial population genetics: where are we now?" (co-organized with J. Novembre, UChicago)	2024
Organizing Committee Midwest Population Genetics Conference	2016-present
Steering Committee NSF EVO-LTER Award: Leveraging long-term ecological research in grasslands: facilitating collaborations between ecologists and evolutionary biologists	2021-present
Course Instructor UCLA/La Kretz Center Workshop in Conservation Genomics	2014, 16, 19
Judge Hamilton Award (Society for the Study of Evolution)	2017, 19

Reviewer including: PNAS; Ecology Letters; Evolution Letters; Genetics; Evolution; American Naturalist; Systematic Biology; Molecular Biology and Evolution; Molecular Ecology; Proceedings of the Royal Society B; American Journal of Human Genetics; Heredity; Molecular Ecology Resources; Methods in Ecology and Evolution; Molecular Phylogenetics and Evolution; New Phytologist; Bioinformatics; Ecology; Ecological Monographs

Society Memberships Society for the Study of Evolution (SSE); Society for Molecular Biology and Evolution (SMBE); American Society of Naturalists (ASN); Genetics Society of America (GSA)

Institutional Service

Nominating Committee (College of LSA)	2024-present

Executive Committee (EEB Dept.)	2023-2025
Executive Committee, UM Genome Science Training Program	2023-present
Collegiate Fellows Faculty Search Committee (EEB Dept.)	2023
Founder, Exploring Careers Beyond Academia with Lunch (EEB Dept.)	2023-present
Ad hoc Faculty Search Committee (EEB Dept.)	2023
Seminar Committee (EEB Dept.)	2022-2023
Diversity, Equity, and Inclusion Committee (Dept. Integrative Biology)	2019-2022
Co-founder, Diversity, Equity, and Inclusion Reading Group (Dept. Integrative Biology)	2019-2022
Co-chair, Presidential Postdoc Fellowship Committee (EEB Program)	2020-2022
Seminar Committee (Dept. Integrative Biology)	2020-2022
Chair Search Committee (Dept. Integrative Biology)	2020-2022
Seminar Committee (EEB Program)	2019-2020
Director Search Committee (EEB Program)	2019-2020
Ad hoc Space Committee (EEB Program)	2019-2020
Strategic Hiring Planning Committee (Dept. Integrative Biology)	2018-2019

INVITED SEMINARS

Louisiana State University	Dept. of Biological Sciences	2022
University of Michigan	Dept. of Ecology and Evolutionary Biology	2022
Institute of Science and Technology Austria	EvoLunch	2021
North Dakota State University	Dept. of Biological Sciences	2021
University of St. Andrews	Centre of Ecol. and Env. Modelling	2021
Cornell University	Dept. of Computational Biology	2020
Western Michigan University	Dept. of Biological Sciences	2020
Ohio State University	Dept. of Evolution, Ecology, Organismal Bio.	2019
University of Kentucky	Dept. of Biology	2019
Ecological Society of America	Landscape Genetics (student-organized)	2018
Indiana University	Dept. of Biology/Precision Health Initiative	2018
Penn State University	Ecology Seminar Series	2018
University of Toronto (St. George)	Dept. of Ecology and Evolutionary Biology	2018
University of Toronto (Mississauga)	Dept. of Biology	2017
University of Chicago	Dept. of Ecology and Evolution	2017
Michigan State University	Kellogg Biological Station	2017
University of Michigan	Center for Statistical Genetics	2016
University of Wyoming	Dept. of Botany	2016
University of Colorado Boulder	Dept. Ecology and Evolutionary Biology	2016
University of San Francisco	Dept. of Biology	2016
University of California Berkeley	Museum of Vertebrate Zoology	2015
Michigan State University	Ecology, Evolution, and Behavior	2015
Stanford University	Dept. Genetics and Biology	2015
University of Southern California	Molecular and Computational Biology	2014
University of Montana	Division of Biological Sciences	2014
University of Minnesota	Dept. of Plant Biology	2014
Sonoma State University	Biology Dept.	2014
University of Texas, Austin	Dept. Integrative Biology	2013

CONTRIBUTED PRESENTATIONS

Society for the Study of Evolution	2012-13,15,17,19,23
Population, Evolutionary, Quantitative Genetics Meeting	2018, 2022
Midwestern Population Genetics Meeting	2016
American Society of Naturalists	2016,18
Society for Molecular Biology and Evolution	2015
Bay Area Population Genomics (BAPG)	2014