

Gideon Bradburd

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Department of Integrative Biology, MSU
East Lansing, MI, 48824

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

EDUCATION & APPOINTMENTS

| | | |
|------------------------------|--|----------------|
| Asst. Prof | <i>Michigan State University</i> Department of Integrative Biology Ecology, Evolution, and Behavior Program | 2017 - present |
| Fixed-term Asst. Prof | <i>Michigan State University</i> Department of Integrative Biology Ecology, Evolution, and Behavior Program | 2016 - 2017 |
| Postdoc | <i>University of California, Berkeley</i> Museum of Vertebrate Zoology Department of Env. Sci. Pol. and Mgmt Advisors: Michael Nachman, Bree Rosenblum | 2015 - 2016 |
| PhD | <i>University of California, Davis</i> Population Biology Graduate Group Department of Ecology and Evolutionary Biology Advisors: Graham Coop, Brad Shaffer | 2009 - 2015 |
| BS | <i>Yale University</i> Ecology and Evolutionary Biology Honors Thesis Advisor: Tom Near | 2004 - 2008 |

FUNDING

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| NIH Early Stage Investigator MIRA (R35) (2020-2025) Incorporating geography into statistical methods for analysis of population genomic DNA (PI: G. Bradburd) | \$1,849,678 |
| NSF Bridging Ecology & Evolution (2020-2023) Testing eco-evolutionary effects of genetic drift and gene flow in stressful environments (PI: S. Fitzpatrick, co-PIs: B. Rothermel, G. Bradburd) | \$920,700 |
| NSF Dimensions of Biodiversity (2017-2021) Diversification of sensory systems in novel habitat: enhanced vision or compensation in other modalities? (PI: J. Boughman, co-PIs: G. Bradburd, H. Hofmann, J. Keagy, D. Stenkamp) | \$1,118,520 |
| Beacon - NSF Center for the Study of Evolution in Action (2016-present) Evolution of sensory systems in response to loss of visual information (PI: J. Boughman, co-PIs: G. Bradburd, H. Hofmann, J. Keagy, D. Stenkamp) | \$127,579 |
| NSF Doctoral Dissertation Improvement Grant (DDIG) (2014-15) The effect of intraspecific host variation on the structure of parasite populations (PI: G. Bradburd, co-PI: G. Coop) | \$13,918 |

PUBLICATIONS

Preprints, In Review, and In Revision

- Clark, M., G.S. Bradburd, M. Akopyan, A. Vega, E. Rosenblum, J. Robertson. Genetic isolation by distance underlies color pattern divergence in red-eyed treefrogs (*Agalychnis callidryas*). (*in review*).
- Shaffer, H.B., E. McCartney-Melstad, P.L. Ralph, G.S. Bradburd, E. Lundgren, J. Vu, B. Hagerty, F. Sandmeier, C. Weitzman, C.R. Tracy. Desert Tortoises in the genomic age: population genetics and the landscape. *bioRxiv* (Public comment on Desert Renewable Energy Conservation).

Published and Accepted

(*denotes equal authorship)

- Toczydlowski, R., L. Liggins, M.R. Gaither, T.J. Anderson, R.L. Barton, J.T. Berg, S.G. Beskid, B. Davis, A. Delgado, E. Farrell, M. Ghoojaei, N. Himmelsbach, A.E. Holmes, S.R. Queeno, T. Trinh, C.A. Weyand, G.S. Bradburd, C. Riginos, R.J. Toonen, E.D. Crandall. Lost in time and space: Poor data stewardship will hinder global genetic diversity surveillance. **PNAS** (*accepted*).
- Puckett, E., S. Murphy, G.S. Bradburd. 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** (*accepted*).
- Schweizer, R.S., M.R. Jones, G.S. Bradburd, J.F. Storz, N. Senner, C. Wolf, Z.A. 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** (*accepted*).
- Hancock, Z.B., E.S. Lehmborg, G.S. Bradburd. 2021. Neo-darwinism still haunts evolutionary theory: A modern perspective on Charlesworth, Lande, and Slatkin (1982). **Evolution** 75: 1244-1255.
- Rothstein, A., R. Knapp, G.S. Bradburd, D. Boiano, E.B. 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.
- Fitzpatrick, S.W. G.S. Bradburd, C.T. Kremer, P.E. Salerno, L.M. Angeloni, W.C. Funk. 2020. Genomic and fitness consequences of genetic rescue in wild populations. **Current Biology** 30: 1-6.
- Schweizer, R.M., J.P. Velotta, C.M. Ivy, M.R. Jones, S.M. Muir, G.S. Bradburd, J.F. Storz, G.R. Scott, Z.A. 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.
- Bradburd, G.S. and P.L. Ralph. 2019. Spatial population genetics: It's about time. **Annual Reviews in Ecology, Evolution, and Systematics** 50: 427-449.
- Grieneisen, L.E., M.J.E. Charpentier, S.C. Alberts, R. Blekman, G.S. Bradburd, J. Tung, E.A. 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.
- Bradburd, G.S., G.M. Coop*, and P.L. Ralph*. 2018. Inferring continuous and discrete population genetic structure across space. **Genetics** 210: 33-52.
- Weber, J.N., G.S. Bradburd, Y.E. Stuart, W.E. Stutz, D.I. Bolnick. 2017. Partitioning the effects of isolation by distance, environment, and physical barriers on genomic divergence between parapatric threespine stickleback. **Evolution** 71: 342-56.
- Hoban, S.*, J. L. Kelley*, K. E. Lotterhos*, M. F. Antolin, G.S. Bradburd, D. B. Lowry, M. L. Poss, L. K. Reed, A. Storfer, M. C. Whitlock. 2016. Finding the genomic basis of local adaptation in non-model organisms: pitfalls, practical solutions, and future directions. **American Naturalist** 188: 379-397.

- Bradburd, G.S., P.L. Ralph, G.M. Coop. **2016**. A Spatial Framework for Understanding Population Structure and Admixture. **PLoS Genetics** 12: e1005703.
- Hammock, B.G., S. Lesmeister, I. Flores, G.S. Bradburd, F.H. Hammock, S.J. 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.
- Agrawal, A.A., A.P. Hastings, G.S. Bradburd, E.C. Woods, T. Züst, J. Harvey, T. Bukovinszky. **2015**. Evolution of plant growth and defense in a continental introduction. **American Naturalist** 186: 1-15.
- Wang, I.J.* and G.S. Bradburd.* **2014**. Isolation by Environment. **Molecular Ecology** 23: 5649-5662.
- Bradburd, G.S., P.L. Ralph, and G.M. Coop. **2013**. Disentangling the effects of geographic and ecological isolation on genetic differentiation. **Evolution** 67: 3258-3273.
- Rejmanek, D, P. Freycon, G.S. 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.
- Rejmanek, D., G.S. 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.
- Near, T.J., C.M. Bossu, G.S. Bradburd, R.L. Carlson, R.C. Harrington, P.R. Hollingsworth Jr., B.P. Keck, D.A. Etnier. **2011**. Phylogeny and temporal diversification of darters (*Percidae: Etheostomatinae*). **Systematic Biology** 60: 565-595.

SOFTWARE

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

| | |
|---|--------------|
| Dr. Zach Hancock | 2021-present |
| Dr. Leonard Jones | 2021-present |
| Dr. Bob Week | 2020-present |
| Dr. Rachel Toczydlowski | 2019-present |
| Dr. Matteo Tomasini | 2019-2021 |
| <i>current position</i> : Postdoctoral Researcher, University of Gothenburg | |
| Dr. Kelsey Yule | 2018-2019 |
| <i>current position</i> : Project Manager of the NEON Biorepository, Arizona State University | |
| Dr. Emily Puckett | 2017 - 2018 |
| <i>current position</i> : Asst. Professor of Biological Sciences, U. Tennessee, Memphis | |

Graduate Students

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| Meaghan Clark | 2019-present |
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Graduate student committees

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

HONORS, AWARDS, & FELLOWSHIPS

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| 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 |

SERVICE & LEADERSHIP

National/International Service

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| Organizing Committee Midwest Population Genetics Conference | 2016-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; 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); American Society of Naturalists (ASN); Genetics Society of America (GSA) | |

Institutional Service

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| Diversity, Equity, and Inclusion Committee (Dept. Integrative Biology) | 2019-present |
| Co-founder, Diversity, Equity, and Inclusion Reading Group (Dept. Integrative Biology) | 2019-present |
| Co-chair, Presidential Postdoc Fellowship Committee (EEB Program) | 2020-present |
| Seminar Committee (Dept. Integrative Biology) | 2020-present |
| Chair Search Committee (Dept. Integrative Biology) | 2020-present |
| Seminar Committee (EEB Program) | 2019-2020 |
| Director Search Committee (EEB Program) | 2019-2020 |
| <i>Ad hoc</i> Space Committee (EEB Program) | 2019-2020 |
| Strategic Hiring Planning Committee (Dept. Integrative Biology) | 2018-2019 |
| Student Representative, Population Biology Grad Group Steering Committee | 2013-14 |
| Chair of Student Research Symposium, Center for Population Biology/Pop Bio Grad Group | 2013 |
| Course Organizer, The Bodega Bay Applied Phylogenetics Workshop | 2012-13 |
| Chair, UC Davis Non-Model Genomics Workshop Committee | 2010 |
| Graduate Student Mentor | 2009-2015 |

TEACHING

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|---|------------|--------------|
| Evolutionary Biology (IBio 849) | Instructor | 2018-present |
| Intro to Statistical Methods in Ecology/Evolution (IBio 830) | Instructor | 2017-present |
| Evolution Discussion Group (IBio 895) | Instructor | 2017-present |
| EVE100 Introduction to Evolution | TA | 2015 |
| EVE103 Macroevolution, Speciation, and Phylogeny (Lecture, Lab) | TA | 2014 |
| Herpetology (Field, Lab, Lecture) | TA | 2012 |

INVITED SEMINARS

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|---|--|------|
| 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

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