

Daniel J. MacGuigan, Ph.D.

Curriculum Vitae

Research Scientist

Department of Biological Sciences, State University of New York at Buffalo

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APPOINTMENTS

Research Scientist

December 2023 – present

University at Buffalo, Department of Biological Sciences

Advisor: Trevor Krabbenhoft

NSF Postdoctoral Fellowship in Biology

December 2021 – November 2023

Award # 2109761: *Parallel genome and phenome evolution within and across fish species*

Advisors: Trevor Krabbenhoft (University at Buffalo) and Matthew Harris (Harvard Medical School)

Postdoctoral Research Associate

November 2020 – November 2021

University at Buffalo, Department of Biological Sciences

Advisor: Trevor Krabbenhoft

EDUCATION

Ph.D. in Ecology and Evolutionary Biology

December 2020

Yale University

New Haven, CT

Dissertation title: *Speciation and Hybridization Across Multiple Temporal Scales in Darters (Teleostei: Percidae)*

[ProQuest Link](#)

Thesis committee: Thomas Near (chair), Michael Donoghue, David Post, and Frank Burbrink

B.S., Concentration in Ecology and Evolution

May 2014

University of Rochester

Rochester, NY

PEER-REVIEWED PUBLICATIONS

[Google Scholar](#)

*co-lead authors

20. Backenstose, N.J.C., **MacGuigan, D.J.**, Osborne, C.A., Bernal, M.A., Thomas, E., Normandeau, E., Yule, D.L., Stott, W., Ackiss, A., Albert, V., Bernatchez, L., and T.J. Krabbenhoft. (In Press). Origin of the Laurentian Great Lakes fish fauna through upward adaptive radiation cascade prior to the Last Glacial Maximum. *Current Biology*. DOI: [10.21203/rs.3.rs-2978383/v1](https://doi.org/10.21203/rs.3.rs-2978383/v1)
19. Brownstein, C. D.*, **MacGuigan, D. J.***, Kim, D., Orr, O., Yang, L., David, S. R., Kreiser, B., and T. J. Near. (2024). The genomic signatures of evolutionary stasis. *Evolution*. DOI: [10.1093/evolut/qpae028](https://doi.org/10.1093/evolut/qpae028)

18. **MacGuigan, D.J.**, Krabbenhoft, T.J., Harrington, R.C., Wainwright, D.K., Backenstose, N.J.C., and T.J. Near. (2023). Lacustrine speciation associated with chromosomal inversion in a lineage of riverine fishes. *Evolution*. DOI: [10.1093/evolut/qp067](https://doi.org/10.1093/evolut/qp067)
17. **MacGuigan, D.J.**, Porto-Hannes, I., Foote, B., Backenstose, N.J.C., Osborne, C.A., Louisor, K., Waterman, H., Chang, S., and T.J. Krabbenhoft. (2023). Spotty distributions: Spotted Gar (*Lepisosteus oculatus*) and Spotted Sucker (*Minytrema melanops*) range expansion in eastern Lake Erie. *Journal of Great Lakes Research*. DOI: [10.1016/j.jglr.2023.05.009](https://doi.org/10.1016/j.jglr.2023.05.009)
16. Near, T.J., Simmons, J.W., Strange, R.M., Brandt, S.L. Thomas, M.R., Harrington, R.C., and **D.J. MacGuigan**. (2023). Systematics of the Stripetail Darter, *Etheostoma kennicotti* (Putman), and the Distinctiveness of the Upper Cumberland Endemic *Etheostoma cumberlandicum* Jordan and Swain. *Ichthyology & Herpetology*. DOI: [10.1643/i2021053](https://doi.org/10.1643/i2021053)
15. **MacGuigan, D.J.***, Mount, G.G.*, Watkins-Colwell, G.J., Near, T.J., and M.R. Lambert. (2023). Genomic Data Clarify *Aquarana* Systematics and Reveal Isolation-by-Distance Dominates Phylogeography of the Wide-Ranging Frog *Rana clamitans*. *Ichthyology & Herpetology*. DOI: [10.1643/h2021129](https://doi.org/10.1643/h2021129)
14. **MacGuigan, D.J.**, Orr, O., and T.J. Near. (2022). Phylogeography, population structure, hybridization, and species discovery in the *Etheostoma nigrum* species complex. *Molecular Phylogenetics and Evolution*. DOI: [10.1016/j.ympev.2022.107645](https://doi.org/10.1016/j.ympev.2022.107645)
13. Krabbenhoft, T.J., **MacGuigan, D.J.**, Backenstose, N.J.C., Waterman, H., Lan, T., Pelosi, J.A., Tan, M., and S.R. Sandve. (2021). Chromosome-Level Genome Assembly of the Chinese Sucker (*Myxocyprinus asiaticus*) Reveals Strongly Conserved Synteny Following a Catostomid-Specific Whole-Genome Duplication. *Genome Biology & Evolution*. DOI: [10.1093/gbe/evab190](https://doi.org/10.1093/gbe/evab190)
12. Melo, B.F., Sidlauskas, B., Near, T.J., Roxo, F.F., Ghezelayagh, A., Ochoa, L.E., Stiasny, M.I., Arroyave, J., Chang, J., Faircloth, B.C., **MacGuigan, D.J.**, Harrington, R.C., Benine, R.C, Burns, M.D., Hoekzema, K, Sanches, N.C., Maldonado-Ocampo, J.A., Castro, R.M.C, Foresti, F., Alfaro, M.E., and C Oliveira. (2021). Accelerated diversification explains the exceptional species richness of an ancient lineage of tropical freshwater fishes. *Systematic Biology*. DOI: [10.1093/sysbio/syab040](https://doi.org/10.1093/sysbio/syab040)
11. **MacGuigan, D.J.**, Hoagstrom, C.W., Domisch, S, Hulsey, C.D., and T.J. Near. (2021). Integrative ichthyological species delimitation in the Greenthroat Darter complex (Percidae: Etheostomatinae). *Zoologica Scripta*. DOI: [10.1111/zsc.12504](https://doi.org/10.1111/zsc.12504)
10. Near, T.J, **MacGuigan, D.J.**, Boring, E., Simmons, J.W., Albanese, B., Keck, B.P., Harrington, R.C., Dinkins, G.R. (2021). A new species of bridled darter endemic to the Etowah River System in Georgia (Percidae: Etheostomatinae: *Percina*). *Bulletin of the Peabody Museum of Natural History*. 62:15-42 DOI: [10.3374/014.062.0102](https://doi.org/10.3374/014.062.0102)
9. Daane, J.M., Dornburg, A., Smits, P., **MacGuigan, D.J.**, Hawkins, M.B., Near, T.J., Detrich, H.W., and M.P. Harris. (2019). Historical contingency shapes adaptive radiation in Antarctic fishes. *Nature Ecology and Evolution*. 3: 1102-1109. DOI: [10.1038/s41559-019-0914-2](https://doi.org/10.1038/s41559-019-0914-2)
8. Bowman Jr, L.L., **MacGuigan, D.J.**, Gorchels, M.E., Cahillane, M.M., and M.V. Moore. (2019). Revealing paraphyly and placement of extinct species within *Epischura* (Copepoda: Calanoida) using molecular data and quantitative morphometrics. *Molecular Phylogenetics and Evolution*. 140. DOI: [10.1016/j.ympev.2019.106578](https://doi.org/10.1016/j.ympev.2019.106578)
7. Ng, J., **MacGuigan, D.J.**, Kelly, A.L., and R.E. Glor. (2019). Do male-male interactions drive changes in dewlap size? *Anolis Newsletter VII*. 206-213. DOI: [10.7936/gjg3-h168](https://doi.org/10.7936/gjg3-h168)
6. **MacGuigan, D.J.** and T.J. Near. (2018). Phylogenomic signatures of ancient introgression in a rogue lineage of darters (Percidae: Etheostomatinae). *Systematic Biology*. 68:329–346. DOI: [10.1093/sysbio/syy074](https://doi.org/10.1093/sysbio/syy074)

5. Near, T.J., **MacGuigan, D.J.**, Parker, E., Struthers, C.D., Jones, C.D., and A. Dornburg. (2018). Phylogenetic analysis of Antarctic notothenioids illuminates the utility of RADseq for resolving Cenozoic adaptive radiations. *Molecular Phylogenetics and Evolution*. 129:268-279. [DOI: 10.1016/j.ympev.2018.09.001](https://doi.org/10.1016/j.ympev.2018.09.001)
4. Schultheis, E.H. and **D.J. MacGuigan**. (2018). Competitive ability, not tolerance, may explain success of invasive species over native and noninvasive exotics. *Biological Invasions*. 20: 2793-2806. [DOI: 10.1007/s10530-018-1733-0](https://doi.org/10.1007/s10530-018-1733-0)
3. Kozal, L.C., Simmons, J. W., Mollish, J.M., **MacGuigan, D.J.**, Benavides, E., Keck, B.C., and T.J. Near. (2017). Phylogenetic and morphological diversity of the *Etheostoma zonistium* species complex with the description of a new species endemic to the Cumberland Plateau of Alabama. *Bulletin of the Peabody Museum of Natural History*. 58:263-286. [DOI: 10.3374/014.058.0202](https://doi.org/10.3374/014.058.0202)
2. **MacGuigan, D. J.**, A. J. Geneva, and R. E. Glor. (2017). A genomic assessment of species boundaries and hybridization in a group of highly polymorphic anoles (*distichus* species complex). *Ecology and Evolution*. 7:3657-3671. [DOI: 10.1002/ece3.2751](https://doi.org/10.1002/ece3.2751)
1. Ng, J., Kelly, A.L., **MacGuigan, D.J.**, and R.E. Glor. (2013). The role of heritable and dietary factors in the sexual signal of a Hispaniolan *Anolis* lizard, *Anolis distichus*. *Journal of Heredity*. 104:862-873. [DOI: 10.1093/jhered/est060](https://doi.org/10.1093/jhered/est060)

MANUSCRIPTS IN REVIEW

1. Ghezelayagh, A., Simmons, J.W., Wood, J.E., Yamashita, T., Thomas, M.R., Blanton, R.E., Orr, O., **MacGuigan, D.J.**, Kim, D., Benavides, E., Keck, B.P., Harrington, R.C., and T.J. Near. Comparative species delimitation of a biological conservation icon, the Snail Darter.

ACADEMIC PRESENTATIONS

Invited Speaker. Cornell University [EvoDay 2024](#) – Hybridization, Introgression, and Admixture. Ithaca, New York. (2024). MacGuigan, D.J. Parallel lacustrine speciation associated with a single chromosomal inversion.

Evolution Meeting (2023). Albuquerque, New Mexico. MacGuigan, D.J., Waterman, H., Backenstose, N.J.C., Tan, M., Pelosi, J., and T.J. Krabbenhoft. Sequences versus synteny: a phylogenomic exploration of Cypriniformes.

Invited Speaker. University at Buffalo Department of Biological Sciences Seminar Series Research Showcase. Buffalo, New York. (2023). MacGuigan, D.J. Genomic architecture of ecological speciation.

Society of Systematic Biologists Standalone Meeting (2023). Mexico City, Mexico. MacGuigan, D.J., Orr, O., and T.J. Near. Parallel speciation in freshwater fishes of Atlantic slope river basins.

Great Lakes Annual Meeting of Evolutionary Genomics (2022). Buffalo, New York. MacGuigan, D.J., Schwarz, P.F., Orr, O., Near, T.J., and T.J. Krabbenhoft. Genomic patterns of post-glacial secondary contact and mosaic hybridization in the Johnny Darter (*Etheostoma nigrum*) species complex.

Evolution Meeting (2022). Cleveland, Ohio. MacGuigan, D.J., Schwarz, P.F., Orr, O., Near, T.J., and T.J. Krabbenhoft. Genomic patterns of post-glacial secondary contact and mosaic hybridization in the Johnny Darter (*Etheostoma nigrum*) species complex.

Invited Contribution. Joint Meeting of Ichthyologists and Herpetologists. ASIH Symposium: Why are there so many kinds of fishes? A showcase of early-career ichthyologists. (2021). Virtual. MacGuigan, D.J., Krabbenhoft, T.J., Backenstose, N.J.C., Lan, T., and T.J. Near. Genomic architecture of lacustrine speciation and gene flow in the Waccamaw Darter (*Etheostoma perlongum*).

- Evolution Meeting (2021). Virtual. MacGuigan, D.J., Krabbenhoft, T.J., Backenstose, N.J.C., Lan, T., and T. J. Near. 2019. Genomic architecture of lacustrine speciation and gene flow in the Waccamaw Darter (*Etheostoma perlongum*).
- Southeastern Fishes Council Meeting (2019). Knoxville, Tennessee. MacGuigan, D.J. and T.J. Near. Phylogeography of the *Etheostoma nigrum* species complex.
- Evolution Meeting (2019). Providence, Rhode Island. MacGuigan, D.J., Krabbenhoft, T.J., Lan, T., and T.J. Near. RADseq and morphometrics reveal fine-scale patterns of lake-stream divergence between two darter species (*Etheostoma perlongum* and *E. olmstedii*).
- Joint Meeting of Ichthyologists and Herpetologists (2018). Rochester, New York. MacGuigan, D.J. and T.J. Near. Genomic data clarify the evolutionary history of two widespread darter species, *Etheostoma nigrum* and *E. olmstedii*.
- NIH Training Program in Genetics Symposium (2018). New Haven, Connecticut. MacGuigan, D.J. and T.J. Near. 21st century natural history: genomic approaches to understanding biodiversity.
- Evolution Meeting (2017). Portland, Oregon. MacGuigan, D.J. and T.J. Near. Finding the common ground: integrative species delimitation of the Greenthroat Darter.
- Evolution Meeting (2016). Austin, Texas. MacGuigan, D.J. and T.J. Near. Genomic signatures of ancient introgression in darters (Percidae: Etheostomatinae).
- Southeastern Fishes Council Meeting (2015). Gainesville, Florida. MacGuigan, D.J. and T.J. Near. 2015. Phylogenomics of the darter clade *Boleosoma*.
- Southeastern Fishes Council Meeting (2015). Gainesville, Florida. MacGuigan, D.J. and T.J. Near. Molecular and morphological species delimitation in the Greenthroat Darter, *Etheostoma lepidum*.
- Joint Meeting of Ichthyologists and Herpetologists (2015). Reno, Nevada. MacGuigan, D.J. and T.J. Near. Molecular and morphological species delimitation in the Greenthroat Darter, *Etheostoma lepidum*.

PROFESSIONAL AFFILIATIONS AND SERVICE

- *Member*: Society for the Study of Evolution
- *Member*: Society of Systematic Biologists
- *Member*: American Society of Ichthyologists and Herpetologists
- *Member*: The Southeastern Fishes Council
- Reviewer for (times reviewed):
 - Proceedings of the Royal Society B (1)
 - Systematic Biology (1)
 - Molecular Ecology (1)
 - Molecular Phylogenetics and Evolution (1)
 - Genome Biology and Evolution (1)
 - BMC Ecology and Evolution (1)
 - BMC Evolutionary Biology (1)
 - Conservation Genetics (2)
 - Heredity (1)
 - Copeia (1)
 - Southeastern Naturalist (1)
 - Southeastern Fishes Council Proceedings (1)

GRANTS AND FELLOWSHIPS

- 2023-2025. Great Lakes Restoration Initiative - US Fish and Wildlife Service. *Effects of genetic variation on Early Mortality Syndrome in Lake Charr (Salvelinus namaycush)*. PI: T.J. Krabbenhoft (University at

Buffalo). Co-PIs: C.A. Osborne (USFWS, University at Buffalo), D.J. MacGuigan (University at Buffalo). \$110,000.

- 2021-2023. NSF Postdoctoral Fellowship in Biology, award #2109761. *Parallel genome and phenome evolution within and across fish species*. \$138,000.
- 2018. Yale Institute for Biospheric Studies Doctoral Dissertation Improvement Award. *Testing Ecological Speciation Using Intraspecific Contrasts*. \$4,977.
- 2016. Yale Institute for Biospheric Studies Doctoral Pilot Award. *Environmental effects on genomic signatures of hybridization*. \$2,500.
- 2016. Society for the Study of Evolution Small Grants Program for Local and Regional Outreach. \$900.
- 2016. Yale University EEB Chair's Fund Award. \$750.
- 2015. Society of Systematic Biology Travel Grant. SSB Standalone Meeting Ann Arbor, MI.

AWARDS AND HONORS

- 1st place poster award at Yale Ecology and Evolutionary Biology Graduate Symposium 2016
- 1st place poster award at the Southeastern Fishes Council Meeting 2015
- University of Rochester Biology Department 2014 Grace McCormack Fund for Biology Prize
- University of Rochester REACH Funding Award, summer 2012 and 2014
- University of Rochester Dean's List eight out of eight eligible semesters

TEACHING AND OUTREACH

[Lunchtime Discovery Series](#), August 16, 2023

North Carolina Museum of Natural Sciences

Public seminar on natural history and conservation research

BIO 425/525: Ecological Genomics, Fall 2021

University at Buffalo

Two guest lectures on collections-based genomics

Introduction to R, Summer 2020

Yale University

Jointly designed an undergraduate summer workshop series featuring mix of lectures and hands-on coding labs

[Fundamentals and Frontiers](#): video lectures by graduate students and postdocs, 2017-2020

Yale University

Supported by Yale Center for Teaching and Learning [Rosenkranz Awards for Pedagogical Advancement](#)

[Evolution Outreach Group at Yale](#), 2014-2020

Yale University

Hands-on evolution activities in local high school classrooms

Supported by the [SSE Small Grants Program for Local and Regional Outreach](#)

[Yale Young Global Scholars](#), Summer 2018

Yale University

Research showcase seminar and lab/museum tours for high school students

Yale Science Diplomats [Science in the News](#), Spring 2017

Yale University

Public lecture series at local libraries and schools

[Splash at Yale](#), April 2016

Yale University

Fish phylogenetics activity for local high school and middle school students

BIOL 104: Ecology and Evolutionary Biology, Spring 2015, Fall 2016, Fall 2017

Yale University

Teaching Fellow

BIO 225: Evolution, Spring 2016

Yale University

Teaching Fellow

BIO 235: Evolution and Medicine, Fall 2015

Yale University

Teaching Fellow

BIO 205: Evolution, Spring 2013, Spring 2014

University of Rochester

Teaching Assistant

BEACON (NSF) High School Summer Institute, July 2013

Kellogg Biological Station, Michigan State University

Guest Lecturer

STUDENT MENTEES

Pia Schwarz, BS and MS, University at Buffalo (now PhD at Yale University)	2021-2023
Chase Brownstein, BS, Yale University (now PhD at Yale university)	2020-2022
Nathalie Eid, BS, Yale University	2019-2021
Jerry Kattawar, MS, Southeastern Louisiana State University	2019
Oliver Orr, BS, Yale University (now Laboratory Coordinator at the Met)	2017-2018
Emily Boring, BS, Yale University	2017-2018
Claire Gottsegen, BS, Yale University	2016-2017
Tim Dawson, BS, Yale University	2016
Ava Ghezeleyagh, BS, Yale University (now PhD at Yale University)	2015-2016
Elyse Parker, BS, Yale University (now postdoc at University of Chicago)	2014-2015