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Education

- 2007 Ph.D. Ecology and Evolutionary Biology,
The University of Michigan
Dissertation title: Predation risk assessment and the anti-predator behavioral dynamics of larval anurans
Advisor: Earl Werner
- 2001 A.B. Biology with Specialization in Ecology and Evolution,
The University of Chicago
Graduated with General Honors and Special Honors in Biology
Advisor: Tim Wootton

Professional Appointments

- 2012-present Postdoctoral Researcher,
The Ohio State University
Advisor: Stuart Ludsin
- 2009-2011 Postdoctoral Researcher,
Oklahoma State University
Advisor: Barney Luttbeg
- 2007-2008 Postdoctoral Researcher,
The University of Michigan
Advisor: Robert Denver

Refereed Publications

Published:

- DuFour, M. R., J. J. Davis, **M. E. Fraker**, E. A. Marschall, C. J. May, C. M. Mayer, J. G. Miner, J. J. Pritt, E. F. Roseman, J. T. Tyson, and S. A. Ludsin. in press. Portfolio theory as a management tool to guide conservation and restoration of multi-stock fish populations. *Ecosphere*.
- Fraker, M. E.**, E. J. Anderson, K.-Y. Chen, J. J. Davis, K. M. DeVanna, M. R. DuFour, E. A. Marschall, C. J. May, C. M. Mayer, J. G. Miner, K. L. Pangle, J. J. Pritt, E. F. Roseman, J. T. Tyson, Y. Zhao, and S. A. Ludsin. in press. Variation in larval advection and early life history of Lake Erie walleye (*Sander vitreus*): insights from an individual-based biophysical model. *Journal of Great Lakes Research*
- Fraker, M. E.**, E. J. Anderson, R. Brodник, L. Carreon-Martinez, K. M. DeVanna, B. J. Fryer, D. D. Heath, J. M. Reichert, and S. A. Ludsin. 2014. Particle backtracking improves breeding subpopulation discrimination and natal-source identification in mixed populations. *PLoS ONE* 10:e0120752.
- Fraker, M. E.** and B. Luttbeg. 2012. A spatially explicit model of predator-prey space games. *Oikos* 121:1935-1944.

- Fraker, M. E.** and B. Luttbegg. 2012. Predator-prey space use and the spatial distribution of predation events. *Behaviour* 149:555-574.
- Fraker, M. E.**, V. Cuddapah, S. A. McCollum, R. A. Relyea, J. Hempel, and R. J. Denver. 2009. The behavioral and endocrine stress response of tadpoles to a chemical cue of predation secreted by conspecifics. *Hormones and Behavior* 55: 520-529.
- Fraker, M. E.** 2010. Risk perception and anti-predator behavior of wood frog (*Rana sylvatica*) tadpoles: a comparison with green frog (*Rana clamitans*) tadpoles. *Journal of Herpetology* 44:390-398.
- Fraker, M. E.** 2009. Predation risk assessment through chemical cues produced by multiple prey. *Behavioral Ecology and Sociobiology* 63: 1397-1402.
- Fraker, M. E.** 2009. The effect of prior experience on a prey's current perceived risk. *Oecologia* 158: 765-774.
- Fraker, M. E.** 2009. The perceptual ability of tadpoles limits the accuracy of their predation risk assessment. *Behaviour* 146: 1025-1036.
- Fraker, M. E.** 2008. The influence of the circadian rhythm of green frog (*Rana clamitans*) tadpoles on their antipredator behavior and the strength of the nonlethal effects of predators. *American Naturalist* 171: 545-552.
- Fraker, M. E.** 2008. The effect of hunger on the strength and duration of the anti-predator behavioral response of green frog (*Rana clamitans*) tadpoles. *Behavioral Ecology and Sociobiology* 62: 1201-1205.
- Fraker, M. E.** and S. D. Peacor. 2008. Statistical tests for biological interactions: a comparison of permutation tests and analysis of variance. *Acta Oecologia* 33: 66-72.
- Fraker, M. E.** 2008. The dynamics of predation risk assessment: responses of anuran larvae to chemical cues of predators. *Journal of Animal Ecology* 77: 638-645.
- Fraker, M. E.**, J. W. Snodgrass, and F. Morgan. 2002. Differences in growth and maturation of blacknose dace (*Rhinichthys atratulus*) across an urban-rural gradient. *Copeia* 2002 (4): 1122-1127.
- In review or in preparation:**
- Fraker, M. E.**, R. Brodniek, E. J. Anderson, L. Carreon-Martinez, K. M. DeVanna, B. J. Fryer, D. D. Heath, J. M. Reichert, and S. A. Ludsins. in revision. Combining microsatellite data with dispersal trajectories of larvae reveals novel stock structure and demographically- important population connectivity in a freshwater fish. (*Molecular Ecology*)
- DeVanna, K. M., R. E. H. Smith, **M. E. Fraker**, and 17 coauthors. in review. A perspective on managing Great Lakes fisheries in the face of human-driven ecosystem change. (*Canadian Journal of Fisheries and Aquatic Sciences*)
- Ludsins, S. A., X. Zhang, D. M. Mason, S. B. Brandt, M. R. Roman, W. C. Boicourt, **M. E. Fraker**, and M. Costantini. in review. Hypoxia reduces availability of quality habitat for Bay anchovy (*Anchoa mitchilli*) in Chesapeake Bay. (*Estuaries and Coasts*)
- Fraker, M. E.**, Y. Zhao, and S. A. Ludsins. in prep. A calibrated and validated hydrodynamic-ecological model of plankton dynamics in the western basin of Lake Erie.
- Ludsins, S. A., and 15 coauthors. in prep. A review and prospectus of likely impacts of climate change on the Great Lakes.

Presentations (invited and contributed)

- 2015 The role of environmental heterogeneity in individual-level variation in performance, University of Mississippi. (invited oral presentation)
- 2015 Hydrodynamic backtracking improves stock discrimination capability in Lake Erie yellow perch, Lake Erie-Inland Waters Annual Research Review, Columbus, Ohio. (invited oral presentation)
- 2014 Biophysical drivers of walleye recruitment variation in Lake Erie, International Association of Great Lakes Research Annual Meeting, Hamilton, Ontario. (invited oral presentation)
- 2014 The role of biophysical processes in the early life history of Great Lakes fish, Western Michigan University. (invited oral presentation)
- 2014 Biophysical drivers of walleye recruitment variation in Lake Erie, Lake Erie-Inland Waters Annual Research Review, Columbus, Ohio. (invited oral presentation)
- 2013 The use of hydrodynamic backtracking as a tool for studying population connectivity, Ecological Society of America Annual Meeting, Minneapolis, Minnesota. (contributed oral presentation)
- 2013 A coupled biophysical model of walleye recruitment in western Lake Erie, International Association of Great Lakes Research Annual Meeting, West Lafayette, Indiana. (invited oral presentation)
- 2013 A coupled biophysical model of walleye recruitment in western Lake Erie, Lake Erie-Inland Waters Annual Research Review, Columbus, Ohio. (invited oral presentation)
- 2012 Predator-prey space games: a general model and empirical patterns, The Ohio State University, Department of Evolution, Ecology, and Organismal Biology. (invited oral presentation)
- 2011 An individual-based model of predator-prey space games, Evolution 2011, Norman, Oklahoma. (contributed oral presentation)
- 2011 Connecting predation risk assessment to prey behavior, The Ohio State University, School of Natural Resources and the Environment. (invited oral presentation)
- 2010 Connecting predation risk assessment to prey behavior, The University of Tulsa, Department of Biological Science. (invited oral presentation)
- 2010 Connecting predation risk assessment to prey behavior, Oklahoma State University, Department of Zoology. (invited oral presentation)
- 2007 Predation risk assessment and the anti-predator behavioral dynamics of larval anurans, The University of Michigan, Department of Ecology and Evolutionary Biology. (invited oral presentation)
- 2006 The effect of circadian rhythms on anti-predator behavior in green frog (*Rana clamitans*) tadpoles, Ecological Society of America Annual Meeting, Memphis, Tennessee. (contributed oral presentation)

- 2005 Some effects of short term temporal variation in predation risk on the behavior of green frog (*Rana clamitans*) tadpoles,
Ecological Society of America Annual Meeting, Montreal, Quebec. (contributed poster)
- 2005 Some effects of short term temporal variation in predation risk on the behavior of green frog (*Rana clamitans*) tadpoles,
Midwest Ecology and Evolution Conference, Carbondale, Illinois. (contributed oral presentation)

Funding (including research grants, fellowships, and other awards)

- in review NSF (IOS), The influence of the prey physiological stress response on predator-prey interactions,
Co-PI with Robert Denver, Stuart Ludsin, and Barney Luttbeg (full proposal invited)
- in review Great Lakes Fishery Commission, Fishery Research Program, Spatial variation in habitat quality as
a driver of Lake Erie walleye population dynamics: past, present, and future, Co-PI with Noel
Aloysius, David Glover, Connor Keitzer, Jay Martin, Yingming Zhao, and Stuart Ludsin (full
proposal invited)
- 2015 The Ohio State University Open Access Fund (\$1,000)
- 2014-2016 Ohio Sea Grant Biennial Large Grant Program, Linking Lake Erie agricultural production to
ecosystem services, Co-PI with Elena May, Seyoum Gebremariam, Jay Martin, and Wendong
Zhang (\$199,630)
- 2012-2015 Federal Sport Fish Restoration Program (F-69-P, Fish Management in Ohio), A biophysical
modeling approach to understanding walleye recruitment in Lake Erie, Co-PI with Stuart Ludsin
(annually renewed; \$78,288 for 2014-15; \$232,112 total)
- 2007 Rackham One-Term Dissertation Fellowship, The University of Michigan (tuition and stipend,
1 semester)
- 2006 E. S. George Reserve Scholarship, The University of Michigan (\$2,058)
- 2005 E. S. George Reserve Scholarship, The University of Michigan (\$3,430)
- 2005 Peter Okkelberg Award, The University of Michigan (\$1,058)
- 2004 E. S. George Reserve Scholarship, The University of Michigan (\$3,000)
- 2004 Block Grant, The University of Michigan (\$1,257)
- 2001-2005 Regents' Fellowship, The University of Michigan (tuition and stipend, 4 years)

Teaching Experience

- Fall, 2015 Instructor of Record, EEOB 8896, Scientific Writing, The Ohio State University
- Winter, 2014 Guest Lecturer, EEOB 3410, General Ecology, The Ohio State University
- Spring, 2008 Instructor of Record, Biology 171, Introductory Biology: Ecology and Evolutionary Biology, The
University of Michigan
- Fall, 2006 Lab Coordinator (Graduate Student Instructor, GSI), Biology 282, Field Ecology, The University of
Michigan
- Winter, 2006 GSI, Biology 162, General Biology, The University of Michigan

Fall, 2005 Lab Coordinator (GSI), Biology 282, Field Ecology, The University of Michigan
 Winter, 2005 GSI and Guest Lecturer, Biology 281, General Ecology, The University of Michigan
 Fall, 2004 Lab Coordinator (GSI), Biology 282, Field Ecology, The University of Michigan
 Fall, 2002 GSI, Biology 282, Field Ecology, The University of Michigan
 Winter, 2002 GSI, Biology 162, General Biology, The University of Michigan

Service

2015 Judge, 67th Annual Ohio Academy of Science State Science Day, Columbus, OH
 2015 Judge, 2015 NMS Undergraduate Research Forum, The Ohio State University
 2014-15 Initiated weekly Behavioral Ecology Discussion Group, The Ohio State University
 2014 Judge, student presentations, IAGLR Annual Meeting, Hamilton, ON
 2014 Judge, 66th Annual Ohio Academy of Science State Science Day, Columbus, OH
 2013 Judge, student presentations, IAGLR Annual Meeting, West Lafayette, IN
 2013 Judge, Denman Undergraduate Research Forum, The Ohio State University
 2012, 14-15 Organizer/Presenter, Annual 6th Graders' AEL Field Trip, The Ohio State University
 2006-2007 Mentor, EEB Graduate Mentorship Program, The University of Michigan
 2005-present Peer reviewer: **Grant proposals:** Great Lakes Fishery Trust, National Science Foundation, Natural Sciences and Engineering Research Council of Canada, Ohio Sea Grant; **Book:** *Trophic Ecology* (Garvey, J. E.); **Journal articles:** *Acta Herpetologica*, *Acta Oecologica*, *American Naturalist*, *Animal Behaviour*, *Animal Cognition*, *Annales Zoologica Fennici*, *Aquatic Ecology*, *Behaviour*, *Behavioral Ecology*, *Behavioral Ecology and Sociobiology*, *Biological Journal of the Linnean Society*, *Canadian Journal of Fisheries and Aquatic Sciences*, *Canadian Journal of Zoology*, *Ecology and Evolution*, *Ecological Modelling*, *Ecosphere*, *Ethology*, *Ethology Ecology and Evolution*, *Frontiers in Biology*, *Global Change Biology*, *The Herpetological Journal*, *Hydrobiologia*, *Iranian Journal of Applied Animal Science*, *Journal of Animal Ecology*, *Journal of Biosciences*, *Journal of Chemical Ecology*, *Journal of Comparative Psychology*, *Journal of Great Lakes Research*, *Journal of Herpetology*, *Landscape Ecology*, *Oecologia*, *Oikos*, *Transactions of the American Fisheries Society*
 2004 Coordinator, EEB Lunch Seminar series, The University of Michigan
 2004-present Mentor of high school student: LaCarr Trent (2015);
 Mentor of undergraduate students: Sarah Szymanski (2004), Jon Falk (2005), Christine Balmes (2005-6), Sarah Seiter (2006), Sara Koelsch (2013-2015);
 Mentor of MS students: Anna Moyer (2009-11), Reed Brodник (2012-2015)

Professional Membership

American Society of Naturalists, Ecological Society of America, International Association for Great Lakes Research

References

Dr. Earl Werner (Ph.D. advisor)
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Dr. Barney Luttbeg (Postdoctoral advisor)
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Dr. Robert Denver (Postdoctoral advisor)
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Dr. Shannon McCauley (teaching reference)
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