

# David “Bo” Bunnell

## Curriculum Vitae

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### Education

- Ph.D. 2002. The Ohio State University; Evolution, Ecology, and Organismal Biology, Columbus, OH. Dissertation Title: “Exploring mechanisms regulating recruitment of white crappie in Ohio reservoirs.”
- M.S. 1997. Clemson University; Fisheries Biology, Clemson, SC. Thesis title: “Diel movement of brown trout in a southern Appalachian river.”
- B.S. 1995. Centre College, *Magna cum laude*; Biology, Danville, KY.

### Employment

- October 2004 – present. Research Fishery Biologist, USGS Great Lakes Science Center, Ann Arbor, Michigan.
- August 2003 – October 2004. Assistant Research Scientist, Chesapeake Biological Laboratory, Solomons, Maryland.
- August 2002 – August 2003. Post-doctoral researcher, Ontario Ministry of Natural Resources, Wheatley, Ontario.
- July 1997 – December 2002. Graduate Research Associate, Ohio State University, Evolution, Ecology, and Organismal Biology, Columbus, Ohio.
- July 1995 – May 1997. Graduate Research Associate, Clemson University Cooperative Fish and Wildlife Research Unit, Clemson, SC.

### Publications

- Bunnell, D. B.**, S. A. Pothoven, P. M. Armenio, L. Eaton, D. M. Warner, A. K. Elgin, L. E. Burlakova, and A. Y. Karatayev. 2019. Spatiotemporal variability in energetic condition of alewife and round goby in Lake Michigan. *Canadian Journal of Fisheries and Aquatic Sciences* <http://dx.doi.org/10.1139/cjfas-2018-0391>
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- Dai, Q., **D. B. Bunnell**, J. S. Diana, S. A. Pothoven, L. Eaton, T. P. O’Brien, and R. T. Kraus. 2019. Energy content of rainbow smelt (*Osmerus mordax*) in lakes Huron and Erie increases with chlorophyll a. *Journal of Great Lakes Research* 45: 830-839
- Marino Jr., J. A., S. D. Peacor, **D. B. Bunnell**, H. A. Vanderploeg, S. A. Pothoven, A. K. Elgin, J. R. Bence, J. Jiao, and E. L. Ionides. 2019. Evaluating consumptive and non-consumptive predator effects on prey dynamics using field time series data. *Ecology*. 100. e02583. DOI: 10.1002/ecy.2583
- Smith, S. D. P., **D. B. Bunnell**, G. A. Burton, Jr., J. J. H. Ciborowski, A. D. Davidson, C. E. Dickinson, L. A. Eaton, P. C. Esselman, M. A. Evans, D. R. Kashian, N. F. Manning, P. B. McIntyre, T. F. Nalepa, A. Perez-Fuentetaja, A. D. Steinman, D. G. Uzarski, and J. D. Allan. 2019. Evidence for interactions among environmental stressors in the Laurentian Great Lakes. *Ecological Indicators* 101: 203-211
- Ives, J. T., B. C. McMeans, K. S. McCann, A. T. Fisk, T. B. Johnson, **D. B. Bunnell**, K. T. Frank, and A. M. Muir. 2019. Food-web structure and ecosystem function in large freshwater lakes: the Laurentian Great Lakes as a model. *Freshwater Biology* 64: 1-23. DOI: 10.1111/fwb.13203
- Bunnell, D. B.**, H. J. Carrick, C.P. Madenjian, E. S. Rutherford, H. A. Vanderploeg, R. P. Barbiero, E. Hinchey-Malloy, S. A.

- Pothoven, C. M. Riseng, R. M. Claramunt, H. A. Bootsma, A. K. Elgin, M. D. Rowe, S. M. Thomas, B. A. Turschak, S. Czesny, K. L. Pangle, D. M. Warner, and G. J. Warren. 2018. Are changes in lower trophic levels limiting the capacity of prey fish biomass in Lake Michigan? Great Lakes Fishery Commission Special Publication 2018-01.
- Kao, Y., M. W. Rogers, and **D. B. Bunnell**. 2017. Evaluating stocking efficacy in an ecosystem undergoing oligotrophication. *Ecosystems* 21: 600-618. DOI: 10.1007/s10021-017-0173-5
- Lynch, A. J., I. G. Cowx, E. Fluet-Chouinard, S. M. Glaser, S. C. Phang, T. D. Beard, Jr., S. D. Bower, J. L. Brooks, **D. B. Bunnell**, J. E. Claussen, S. J. Cooke, Y.-C. Kao, K. Lorenzen, B. J. E. Myers, A. J. Reid, J. J. Taylor, and S. Youn. 2017. Inland fisheries - invisible but integral to the UN Sustainable Development Agenda for ending poverty by 2030. *Global Environmental Change* 47: 167-173.
- Myers, B. J. E., A. J. Lynch, **D. B. Bunnell**, C. Chu, J. A. Falke, R. P. Kovach, T. J. Krabbenhoft, T. J. Kwak, and C. P. Paukert. 2017. Global synthesis of the predicted and observed effects of climate change effects on inland fish. *Reviews in Fish Biology and Fisheries*. doi:10.1007/s11160-017-9476-z
- Collingsworth, P. D., **D. B. Bunnell**, M. W. Murray, Y. Kao, Z. S. Feiner, R. M. Claramunt, B. M. Lofgren, T. O. Hook, and S. A. Ludsin. 2017. Climate change as a long-term stressor for the fisheries of the Laurentian Great Lakes of North America. *Reviews in Fish Biology and Fisheries*. 27(2), 363-391. doi:10.1007/s11160-017-9480-3
- Nowicki, C. J., P. A. Armenio, **D. B. Bunnell**, D. M. Warner, H. A. Vanderploeg, J. F. Cavaletto, and C. M. Mayer. 2017. Biotic and abiotic factors influencing zooplankton vertical distribution in Lake Huron. *Journal of Great Lakes Research* 43: 1044-1054.
- Bronte, C.R., **D. B. Bunnell**, S. R. David, R. Gordon, D. Gorsky, M. J. Millard, J. Read, R. A. Stein, and L. Vaccaro. 2017. Report from the workshop on coregonine restoration science. U.S. Geological Survey Open-File Report. 2017-1081, v, 36 p. <https://doi.org/10.3133/ofr20171081>
- Lynch, A. J., I. G. Cowx, E. Fluet-Chouinard, S. M. Glaser, S. C. Phang, T. D. Beard, Jr., S. D. Bower, J. L. Brooks, **D. B. Bunnell**, J. E. Claussen, S. J. Cooke, Y.-C. Kao, K. Lorenzen, B. J. E. Myers, A. J. Reid, J. J. Taylor, and S. Youn. 2017. Inland fisheries - invisible but integral to the UN Sustainable Development Agenda for ending poverty by 2030. *Global Environmental Change* 47: 167-173.
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- Armenio, P. M., **D. B. Bunnell**, N. M. Watson, J. V. Adams, and W. M. Woelmer. 2016. It's like night and day: diel net-effects on Cercopagidae densities in the Laurentian Great Lakes. *Journal of Great Lakes Research* 43: 394-398.
- Zischke, M. T., **D. B. Bunnell**, C. D. Troy, E. Berglund, D. Carroffino, M. P. Ebener, J. He, S. Sitar, and T. O. Hook. 2016. Lack of recruitment synchrony of lake whitefish *Coregonus clupeaformis* in the Great Lakes region. *Journal of Great Lakes Research* 43: 359-369.
- Eshenroder, R. L., P. Vecsei, N. E. Mandrak, D. L. Yule, O. T. Gorman, T. C. Pratt, **D. B. Bunnell**, and A. M. Muir. 2016. Ciscoes (*Coregonus*, subgenus *Leucichthys*) of the Laurentian Great Lakes and Lake Nipigon. Great Lakes Fishery Commission Miscellaneous Publication 2016-01.
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- Kerns, J. A., M. W. Rogers, **D. B. Bunnell**, R. M. Claramunt, and P. D. Collingsworth. 2016. Comparing life history characteristics of Lake Michigan's naturalized and stocked Chinook Salmon. *North American Journal of Fisheries Management* 36: 1106-1118.
- Lauber, T. B., R. C. Stedman, N. A. Connelly, L. G. Rudstam, R. C. Ready, G. L. Poe, **D. B. Bunnell**, T. O. Höök, M. A. Koops, S. A. Ludsin, and E. S. Rutherford. 2016. Using scenarios to assess possible future impacts of invasive species in the Laurentian Great Lakes. *North American Journal of Fisheries Management* 36: 1292-1307.
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- Whitney, J. E., R. Al-Chokhachy, **D. B. Bunnell**, C. A. Caldwell, S. J. Cooke, E. J. Eliason, M. W. Rogers, A. J. Lynch, C. Paukert, and D. Fulton. 2016. Physiological basis of climate change impacts on North American inland fishes. *Fisheries* 41: 332-345
- Keeler, K. M., **D. B. Bunnell**, J. S. Diana, J. V. Adams, J. G. Mychek-Londer, D. M. Warner, D. Yule, and M. Vinson. 2015. Evaluating the importance of abiotic and biotic drivers on *Bythotrephes* in Lakes Superior and Michigan. *Journal of Great Lakes Research* 41(Suppl. 3): 150-160.
- Bunnell, D. B.**, B. M. Davis, M. A. Chriscinske, K. M. Keeler, and J. G. Mychek-Londer. 2015. Diet shifts by planktivorous and benthivorous fishes in northern Lake Michigan in response to ecosystem changes. *Journal of Great Lakes Research* 41(Suppl. 3): 161-171.
- Madenjian, C. P., **D. B. Bunnell**, D. M. Warner, S. A. Pothoven, G. L. Fahnenstiel, T. F. Nalepa, H. A. Vanderploeg, I. Tsehaye, R. M. Claramunt, R. D. Clark. 2015. Changes in the Lake Michigan food web following dreissenid mussel invasions: a synthesis. *Journal of Great Lakes Research* 41(Suppl. 3): 217-231.
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- Manning, N. F., J. M. Bossenbroek, C. M. Mayer, **D. B. Bunnell**, J. T. Tyson, R. G. Rudstam, and J. R. Jackson. 2014. Modeling plumes and blooms: turbidity type and intensity effects on the growth and starvation mortality of yellow perch. *Canadian Journal of Fisheries and Aquatic Sciences* 71: 1544-1553.
- Newman, K. R., **D. B. Bunnell**, and D. W. Hondorp. 2014. Openness to the unexpected: our pathways to careers in a federal research laboratory. Pages 201-206 in *Future of Fisheries: Perspectives for Emerging Professionals*. W. W. Taylor, A. J. Lynch, N. Leonard, editors.
- Turschak, B. A., **D. B. Bunnell**, S. Czesny, T. O. Hook, J. Janssen, D. M. Warner, and H. A. Bootsma. 2014. Nearshore energy subsidies support Lake Michigan fishes and invertebrates following major changes in food web structure. *Ecology* 95: 1243-1252.
- Rogers, M. W., **D. B. Bunnell**, C. P. Madenjian, and D. M. Warner. 2014. Lake Michigan offshore ecosystem structure and food-web changes from 1987 to 2008. *Canadian Journal of Fisheries and Aquatic Sciences* doi.org/10.1139/cjfas-2013-0514
- O'Malley, B. P., and **D. B. Bunnell**. 2014. Diet of *Mysis diluviana* reveals seasonal patterns of omnivory and consumption of invasive species in offshore Lake Michigan. *Journal of Plankton Research*. doi:10.1093/plankt/fbu038
- Bunnell, D. B.**, J. G. Mychek-Londer, and C. P. Madenjian. 2014. Population-level effects of egg predation on a native planktivore in a large freshwater lake. *Ecology of Freshwater Fish* doi: 10.1111/eff.12112
- Bunnell, D. B.**, R. P. Barbiero, S. A. Ludsin, C. P. Madenjian, G. J. Warren, D. M. Dolan, T.O. Brenden, R. Briland, O.T. Gorman, J. X. He, T. H. Johengen, B. F. Lantry, T. F. Nalepa, S. C. Riley, C. M. Riseng, T. J. Treska, I. Tsehaye, M. G. Walsh, D. M. Warner, and B. C. Weidel. 2014. Changing ecosystem dynamics in the Laurentian Great Lakes: bottom-up and

- top-down regulation. *BioScience* 64:26-39.
- Collingsworth, P. D., **D. B. Bunnell**, C. P. Madenjian, and S. R. Riley. 2014. Comparative population dynamics of alewife (*Alosa pseudoharengus*) and bloater (*Coregonus hoyi*) in Lakes Michigan and Huron. *Transactions of the American Fisheries Society* 143: 294-309.
- Seelbach P. W., L. R. Fogarty, **D. B. Bunnell**, S. K. Haack, and M. W. Rogers. 2013. Developing a conceptual framework for Lake Michigan nearshore ecosystem: relevance to Lake Michigan Lakewide Management Plan goals. U.S. Geological Survey Open-File Report. 2013-1138, v, 36 p. <http://pubs.usgs.gov/of/2013/1138/>
- Mychek-Londer, J. G., **D. B. Bunnell**, W. Stott, J. S. Diana, J. R. P. French III, and M. A. Chriscinske. 2013. Using diets to reveal overlap and egg predation among benthivorous fishes in Lake Michigan. *Transactions of the American Fisheries Society* 142:492–504.
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- Bunnell, D. B.**, M. J. Gonzalez, and R. A. Stein. 2003. Zooplankton influences growth, but not survival, of first-feeding *Pomoxis* spp. larvae. *Canadian Journal of Fisheries and Aquatic Sciences*. 60: 1314-1323.
- Bunnell, D. B.** and E. A. Marschall. 2003. Optimal energy allocation to ovaries after spawning. *Evolutionary Ecology Research*. 5: 439-457.
- McCollum, A. B., **D. B. Bunnell**, and R. A. Stein. 2003. Cold, northern winters: the importance of temperature to survival of age-0 white crappie. *Transactions of the American Fisheries Society*. 132: 977-987.
- Burrell, K. B., D. L. Van Lear, **D. B. Bunnell**, J. J. Isely, and C. A. Dolloff. 2000. Seasonal movement of brown trout in the Chattooga River watershed. *Transactions of the American Fisheries Society* 129: 1373-1379.
- Bunnell, D. B.** and J. J. Isely. 1999. Influence of temperature on mortality and retention of simulated transmitters in rainbow trout. *North American Journal of Fisheries Management* 19:152-154.
- Bunnell, D. B.**, J. J. Isely, K. B. Burrell, and D. L. Van Lear. 1998. Diel movement of brown trout in a southern appalachian river. *Transactions of the American Fisheries Society* 127: 630-636.

### Selected Technical Reports

- Bunnell, D. B.**, J. G. Mychek-Londer, J. S. Diana, W. Stott, C. P. Madenjian. 2013. Evaluating the negative effects of benthic egg predators on bloater recruitment in northern Lake Michigan. Great Lakes Fishery Commission Project Completion Report. 110 pp.
- Ludsin, S., K. Pangle, L. Carreon-Martinez, N. Legler, J. Reichert, D. Heath, B. Fryer, T. Johnson, J. Tyson, T. Hook, G. Leshkevich, D. Mason, **D. Bunnell**, C. Mayer, T. Johengen, H. Vanderploeg, and Al Drelich. 2011. River discharge as a predictor of Lake Erie yellow perch recruitment. Great Lakes Fishery Commission Project Completion Report. 40 pp.
- Daley, B. A., **D. B. Bunnell**, B. M. Davis, S. C. Riley, E. F. Roseman, J. F. Savino, J. S. Schaeffer, and D. M. Warner. 2009. The role of invasive species in Lake Huron food web disruptions. US EPA Great Lakes National Program Office Research Completion Report.
- Bunnell, D. B.**, and T. J. Miller. 2006. An Individual-Based Modeling Approach for Blue Crab in Chesapeake Bay: Merging Economics With Biology (Poster). *In* Proceedings of the First All-USGS Modeling Conference, November 14–17, 2005. Edited by A. Frondorf. U.S. Department of Interior, U.S. Geological Survey Scientific Investigations Report 2006–5308.
- Miller, T. J., S. J. D. Martell, **D. B. Bunnell**, G. Davis, L. Fegley, A. Sharov, C. Bonzek, D. Hewitt, J. Hoenig, and R. N. Lipcius. 2005. Stock assessment of the blue crab in Chesapeake Bay, 2005. University of Maryland Center for Environmental Science Technical Report Series No. TS-487-05.
- Bunnell, D. B.**, and R.A. Stein. 2003. Exploring mechanisms underlying crappie populations in Ohio reservoirs. Federal Aid in Sport Fish Restoration Project. Ohio Department of Natural Resources Final Performance Report F-69-P, Columbus, Ohio.

### Invited Seminars

- Purdue University, Department of Forestry and Natural Resources. March 2017.
- University of Illinois, Urbana-Champaign, Department of Natural Resources and Environmental Sciences. October 2015.
- Grand Valley State University, Annis Water Resources Institute. April 2015.
- Central Michigan University, Biology Department. November 2014.
- USGS Ecosystems Science Strategy Planning Team. May 2011.
- Department of Fisheries & Oceans, Canada. Cisco Workshop, February 2011.
- Centre College, Biology and Statistics workshop, October 2010.
- Kent State University, Department of Biological Sciences, November 2008.
- Bowling Green State University, Department of Biological Sciences, October 2008.
- University of Toledo, Department of Environmental Sciences, February 2008.
- Michigan State University, Dept. of Fisheries and Wildlife, October 2007.
- North Carolina State University, Dept. of Zoology, April 2007.
- Great Lakes Fishery Commission, Board of Technical Experts, February 2007.
- The Ohio State University, Dept. of Evolution, Ecology, and Organismal Biology. February 2007.
- “Restoration of Native Fishes” workshop, Great Lakes Fishery Commission. November 2006.
- Eastern Michigan University, Biology Department, October 2006.
- USGS Great Lakes Science Center, August 2004.
- University of St. Thomas, Biology Department, February 2003
- Miami University, Department of Zoology, October 2002.
- Otterbein College, Biology Department, May 2001.

John Carroll University, Biology Department. March 2001.

Oak Ridge National Laboratory, October 1997.

Centre College, Biology Department, May 1997.

### External Grants

“Linkages between genetics, form, and function in Coregonines”. Lead PI: D. Bunnell. Co-PI: W. Stott, T. O’Brien, B. Weidel, R. Eshenroder, A. Muir, C. Olds, and J. Vander Zanden. Environmental Protection Agency, Great Lakes Restoration Initiative, 2019. Total award: \$73,570.

“Historical habitat uses by *Coregonus artedii* in the upper Great Lakes and critical embayments”. Lead PI: **D. Bunnell**. Co-PI: Y. Kao and O. Gorman. Environmental Protection Agency, Great Lakes Restoration Initiative, 2018. Total award: \$135,676.

“Linking fish to lower trophic level variability at the lakewide scale in Lake Huron.” Lead PI: **D. Bunnell**. Co-PI: D. Warner. Environmental Protection Agency, Great Lakes Restoration Initiative, 2017. Total award: \$372,417.

“Historical habitat use by *Coregonus artedii* in Lake Michigan.” Lead PI: **D. Bunnell**. Co-PI: Y. Kao. Environmental Protection Agency, Great Lakes Restoration Initiative, 2017. Total award: \$99,443.

“Evaluating linkages between tributary inputs and secondary production in Lake Michigan.” Lead PI: **D. Bunnell**. Co-PI: D. Warner. Environmental Protection Agency, Great Lakes Restoration Initiative, 2014-2015. Total award: \$525,000.

“Developing new strategies for the global assessment of inland fisheries and predicting the response of inland fisheries to regional climate change” Co-PIs: **D. Bunnell**, M.W. Rogers, D. Beard. USGS National Climate Change and Wildlife Center. 2001-2012. Total award: \$536,393

“Development and correlation of physical process indices with inter-annual recruitment variability in Lake Michigan.” Great Lakes Fishery Commission. PI: C. Troy (Purdue U). Co-PIs: T. Hook and **D. Bunnell**. Total award = \$211,341.

“Exploring life history characteristics of naturalized versus stocked Chinook salmon”. Great Lakes Fishery Trust. PI: M. Rogers. Co-PI: **D. Bunnell** and P. Collingsworth. Total award: \$256,107.

“The effect of changing energy pathways on Lake Huron fish production”. Lead PI: **D. Bunnell**. Co-PIs: D. Warner, B. Davis, M. Rogers. Environmental Protection Agency, Great Lakes Restoration Initiative, 2010-2011. Total award: \$421,500.

“Facilitation of Ecopath modeling in the Great Lakes”. Lead PI: Mark Rogers. Co-PI: **D. Bunnell**. Great Lakes Fishery Commission, 2011. Total award: \$9,645.

“Changes in energy transfer within Great Lakes food webs: implications for fish production”. Lead PI: **D. Bunnell**. Co-PIs: C. Madenjian, D. Warner, B. Davis. Environmental Protection Agency, Great Lakes Restoration Initiative, 2010-2011. Total award: \$750,000.

“Forecasting climate-change induced effects on recreational and commercial fish populations in the Great Lakes”. Lead PI: **D. Bunnell**, Co-PIs: R. Claramunt (Michigan DNR), K. Kowalski, B. Lesht (U. Illinois), B. Lofgren (NOAA), C. Madenjian, M. Murray (National Wildlife Federation), S. Riley, E. Roseman, D. Warner. USGS National Climate Change and Wildlife Center. 2009-2011. Total award: \$499,987.

“Evaluating the negative effects of slimy sculpins on bloaters in Lake Michigan”. Lead PI: **D. Bunnell**, Co-PIs: C. Madenjian, E. Rutherford, W. Stott. Great Lakes Fishery Commission. 2009-2010. Total award: \$169,349

“Role of invasive species in Lake Huron food web disruptions”. Environmental Protection Agency, Great Lakes National Program Office. J. Savino, **D. Bunnell**, B. Dorgan, S. Nichols, E. Roseman, D. Warner. 2007 – 2008. Total award: \$192,685.

“River discharge as a predictor of Lake Erie yellow perch recruitment.” Great Lakes Fishery Commission. Lead PI: S. Ludsin, Co-PIs: D. Mason, H. Vanderploeg, G. Leshkevich, T. Johnson, J. Tyson, C. Mayer, **D. Bunnell**, D. Heath, B. Fryer, and T. Hook. 2006 – 2008. Total award: \$339,583.

“Development of bioeconomic models for blue crabs in the Chesapeake Bay.” Maryland Sea Grant. PI: **D. B. Bunnell** and T. J. Miller. 2005 - 2006. Total award: \$61,996.

“Exploring mechanisms regulating crappie populations in Ohio reservoirs”. Ohio Department of Natural Resources grant. 1998 - 2002. PI: R. A. Stein, Ohio State University. Total award= \$506,432. (I participated and helped lead all aspects of the grant, but not permitted to be a PI).

### Honors and Awards

James M. Moffett Publication Award, 2018 and 2007. Presented for the best peer-reviewed publication in the GLSC in 2017

and 2006, respectively.

Special Thanks to Achieve Results (STAR) Award, USGS Great Lakes Science Center, August 2009. Awarded for stint as Acting Western Basins Ecosystems Branch Chief.

USGS Leadership 101 course, February 2007. Nominated to take weeklong class on leadership skills development.

STAR Award, USGS Great Lakes Science Center, December 2006. Awarded for high research productivity.

USGS Leadership Coin, March 2006. Awarded for leadership in starting GLSC-Center-wide Brown bag lunch seminar series.

Honorable Mention, Best Student Paper Award. 2001. Southern Division of the American Fisheries Society, Mid-Year meeting, Jacksonville, FL.

Preparing Future Faculty Program. 2000-2001. The Ohio State University.

E. Wilbur Cook Biological Sciences Award. 1995. Centre College.

Phi Beta Kappa. 1995. Centre College

### Teaching Experience

2019, 2016, 2014, 2012, 2010. Fisheries Science and Management, University of Michigan. Instructor for course.

2019. Invited (by Paul Seelbach) guest lecture for Science and Management of the Great Lakes: School for Environment and Sustainability, University of Michigan. Taught "Offshore food-webs in the Great Lakes: an ecosystem perspective to inform fish management"

2017. Invited (by Jim Diana) guest lecture for Fish Ecology: School of Natural Resources and the Environment, University of Michigan. Taught "Predation and structure".

2017, 2011. Invited (by Tomas Hook and Cary Troy) guest lecture for Forestry and Natural Resources 693: Great Lakes Science and Management, Purdue University. Taught "Great Lakes Fisheries Management and Sustainability".

2011. Invited (by Larissa Sano) guest lecture for Biological Sciences 315: Aquatic Ecosystems, University of Michigan-Dearborn. Taught "Great Lakes Fisheries Management and Sustainability".

2008-2010. Invited (by Ted Batterson) guest lecture for Great Lakes: Biology and Management (FW 207), Michigan State University. Taught "Management of Great Lakes Fisheries".

2007. Invited (by Tomas Hook) guest lecture for Great Lakes Science and Management (NRE 639), University of Michigan. Taught "Fisheries Management and Sustainability".

Invited (by Kristi Arend) guest lecture for Ichthyology (EEOB 621), Ohio State University at Stone Laboratory. Taught "Reproductive life history strategies".

2001. Graduate Teaching Assistant for Evolution (EEOB 400), The Ohio State University. Led discussions, review sessions, and problem sets for two recitations. Helped write and grade essay examinations for lectures.

1999. Graduate Teaching Assistant for Introduction to Ecology (EEOB 413), The Ohio State University. Served as "Head GTA" in charge of all four laboratory sections and GTAs. Led weekly meetings to discuss previous and upcoming laboratories. Taught one laboratory section. Provided changes to the laboratory handbook designed by professor. Graded all assignments in my laboratory section, and graded exams and research papers from the lecture portion of the course.



1998. Graduate Teaching Assistant for Introduction to Ecology (EEOB 413), The Ohio State University. Taught one laboratory section and graded exams and research papers from the lecture portion of the course.
1995. Student Teacher, Garrard County (KY) High School. Independently taught Advanced Anatomy/Physiology and Advanced Placement Biology for four months. Formulated lesson plans, devised laboratories, and created tests to meet curriculum set forth by supervising teacher.

#### **Professional service**

Associate Editor, *Journal of Great Lakes Research*, 2019 – present.

*Invited speaker* to Lake Michigan stakeholder meeting sponsored by Illinois Department of Natural Resources. Chicago, IL. February 2019

*Invited Expert* to provide lower trophic level expertise at a Great Lakes Fishery Commission and Great Lakes Fishery Trust workshop for managers seeking to set research priorities for Lake Whitefish in the Great Lakes. February 2018.

*Invited lead organizer* for GLFC workshop on lower trophic level effects on fisheries management. Cornell University August 2017.

*Invited outside reviewer* to evaluate Promotion to Full Professor for scientist at the Illinois Natural History Survey. November 2017.

*Invited expert panelist* to oversee International Joint Commission Project “Understanding declining productivity in offshore waters of the Great Lakes”. May 2017- April 2018.

*Invited expert workshop attendee* at Food and Agriculture Organization (of the United Nations) sponsored workshop entitled “Improving our knowledge on small-scale fisheries: Data needs and methodologies”. June 2017.

Associate Editor, *Transactions of the American Fisheries Society*, 2007 – 2015.

*Invited member*, Science Advisory Board to the Great Lakes Fishery Trust, Review full proposals submitted to the Great Lakes Fishery Trust and recommend funding in excess of \$1 million. 2013-2015.

*Invited presenter*, Lake Michigan Yellow Perch Summit, which was a meeting of stakeholders and managers interested in improved understanding of the scientific underpinnings of management decisions for Lake Michigan yellow perch. Chicago, IL March 2014

*Invited participant*, workshop on global inland fisheries sustainability, and brainstorming new methods to estimate global production. Pitlochry, Scotland, May 2012.

*Invited expert panelist*, Department of Fisheries and Oceans, Canada, for their stock assessment of snow crab in the southern Gulf of St. Lawrence, Canada. February 2012.

*Invited Editor*, State of Lake Michigan. Document published by the Great Lakes Fishery Commission every 5 years to evaluate progress towards the achievement of the Fish Community Objectives for Lake Michigan during 2005-2010. My responsibilities include writing introductory and concluding chapters, and all editorial duties associated with the other four chapters of the document. 2010-2011.

*Invited member*, scientific workshop on the status of endangered and threatened coregonid (cisco) stocks in Canada. Sponsored by Department of Fisheries and Oceans, Canada. 2011.

*Invited member*, Scientific review panel for a 2007 Brookings Institute Study entitled, “Healthy waters, strong economy: the benefits of restoring the Great Lakes Ecosystem”. 2006-2007.

### **Graduate Student Advising**

Justin Londer, M. S. Student, University of Michigan, 2009-2011. "Diet overlap and food habits of slimy sculpin, deepwater sculpin, and round goby during winter and spring in offshore Lake Michigan". With Dr. Jim Diana

Kevin Keeler, M. S. Student, University of Michigan, 2011-2014. "Determining the role of fish planktivory on spiny water flea production in the Upper Great Lakes". With Dr. Jim Diana

Qihong Dai, M.S. Student, University of Michigan, 2017-2018. "Energy content of rainbow smelt (*Osmerus mordax*) in Lake Huron, and a comparison between Lake Huron and Erie". With Dr. Jim Diana

Hannah Schaefer, M.S. Student, University of Michigan, 2017-2019. "Predicting spawning habitat for Lake Whitefish *Coregonus clupeaformis* and Cisco *Coregonus artedii* in the Lake Erie and Lake Ontario regions using classification and Regression Tree (CART) and Random Forest Models". With Dr. Jim Diana and Dr. Ed Roseman

### **Graduate Student Committees**

Nathan Manning, PhD Student, University of Toledo. 2007-2013. "Modeling the Effects of Turbidity on Age-0 Yellow Perch (*Perca flavescens*) in the Western Basin of Lake Erie"

Joseph Beuchel, M.S. Student, The Ohio State University, 2004-2006. "Latitudinal trends in seasonal life-history strategies: comparisons of bluegill and crappie."

Shea Vokel, M.S. Student, Michigan State University, 2016-2019. "Evaluation of changes in sculpin populations in the Great Lakes associated with shifts in benthic species composition".

### **Post-doctoral advising**

Paris Collingsworth, 2009-2010. Currently Assistant Research Professor, Purdue University

Mark W. Rogers, 2010-2012. Currently Assistant Professor at Tennessee Tech University

Andrew Deines, 2013-2015. Currently employed by Exponent, in Seattle, Washington

Carly Nowicki, 2015-2016. Currently Assistant Professor at Madonna University

Yu-Chun Kao, 2015- present